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THE PATHOGENIC PROBLEM OF SO-CALLED CRITICAL ALLERGIC CONJUNCTIVITIS

(Specific sensitization—Non-specific sensitization-Instability of organic colloids)

BY

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GENERAL pathology undergoes continual revision, required by the rapid progress made in our knowledge concerning humoral conditions. Familiarity with evolution of this kind is absolutely necessary in the special field which interests us. Advance in ideas dealing with anaphylaxis and immunity is incessantly presenting various angles of the pathogenic questions related to certain ocular disturbances. A close study of seasonal forms of conjunctivitis and crises intimately related to these conditions raises the questions of idiosyncrasy and anaphylactic sensitization.

1. *Historical.* A. *Clinical relations.*—Spring, or vernal, conjunctivitis was, for a long time, grouped with infectious forms of conjunctivitis. Writers of the last century, however, mention certain facts morphologically differentiating vernal from infectious conjunctivitis. In 1846, Arlt published three cases of gelatinous infiltration of the corneal limbus. Under the term perikeratic hypertrophy of the conjunctiva Desmarres presented, in 1847, bulbar changes identical with those described by Arlt and, in his clinical courses given in 1854, von Graefe described, accompanying

these perilimbic gelatinous infiltrations, pavement-like proliferations occurring in the tarsal conjunctiva.

Then ensued the bacteriological epoch. Since bacteriology revealed no bacteria and also since the current treatment of conjunctivitis was ineffective, some of the aetiological studies were directed toward essential tissue conditions (of the soil, or "terrain"). For example, Terson considered these forms of conjunctivitis related to arthritis, while Angelucci assigned them to a lymphatic constitution. Other investigations dealt with non-bacterial causes of irritation.

As early as 1872, Saemisch stressed the periodicity of the disease and Danvers noted resemblances between vernal conjunctivitis and hay fever. Schreiber, of Magdeburg, wrote: "It seems to me that the flowering season of grasses constitutes an essential factor in exacerbations of the signs of irritation. I have treated a farmer and his son, aged 10 years, the father presenting typical hay fever and the son vernal conjunctivitis, which was of recurrent type and invariably occurred when the father was affected with hay fever."

Horner and his pupil Vetsch observed analogies between spring conjunctivitis and the erythema of pellagra which occurs on parts of the skin exposed to sunlight. Schmeichler and Schiele actually termed spring conjunctivitis chronic solar eczema. Kreibich, of Gratz, noting the fact that thickening about the corneal limbus occurs in some lichenoid forms of aestival prurigo, called attention to the possible influence of the blue and ultra-violet rays of the spectrum. How far is the light-factor important? Is spring conjunctivitis produced by light, as solar erythema is, or as dazzling and blindness are caused by reflection from the snow? I merely touch upon these points. They gave rise to a remarkable expression, stated in 1907 by Axenfeld,[1] in his Report to the French Society of Ophthalmology, as follows: "According to the theory of light, the sensitizing factor is supplied by the human individual. It sensitizes in a way analogous with that of fluorescent substances, such as quinine sulphate, eosin or fluorescein, which sensitize to the action of the blue and ultra-violet rays. Further studies should, therefore, prove the existence of this sensitizing factor in the affected individuals."

B. *Experimental pathology.*—Experimental work has added certain data to clinical facts and the pre-existing hypotheses concerning the pathogeny.

von Szily,[2] in 1913, published a work on anaphylaxis as occurring in diseases of the eye. One chapter of this book reports experiments made by Wesseley, Colombo, Stanculéanu and Nita, Dold and Rados, who utilized the conjunctiva of the dog and guinea-pig for the introduction of proteins into the organism. Following

subconjunctival injections, or simple instillation, of horse serum in sensitized animals, these writers observed that the conjunctiva has the same absorbent capacity as that possessed by other mucous membranes and that it may give rise to reactions of anaphylactic nature.

At this same period, Weinberg and A. Julien[3] presented papers to the Biological Society on the fatal effects occurring in horses following instillations into the conjunctival sac of toxins produced by ascarides. "These effects," they remark, "appear to be of anaphylactic character, the affected animals having been previously sensitized by the ascarides infesting and eliminated from them." In 1918, van Es and A. F. Schalck[4] similarly reported, in the Annals of the Pasteur Institute, the results of studies undertaken to develop the anaphylactic nature of certain parasitic intoxications occurring in different animals.

Such was the status of the question in 1921. At this period, so close to our own, the observations of experimental medicine were as if separated by an impermeable partition from the pathological facts which are now interesting us.

II. *Present work.* A. *Endocrine disturbances.*—The November number of *Arch. d'Ophtal.* (1922) contains[5] two cases of conjunctival reaction, noted in the spring of that same year and occurring in individuals bearing different congenital anomalies which resembled each other because a metabolic disturbance existed in both cases, consisting of diabetes in one, and of myxoedema and hypo-ovarian phenomena in the other.

The endocrine disturbances present in these two cases constituted their principal feature of interest. The factor acting as antigen upon the conjunctival mucosa was identified and I concluded my comment on the cases by stating, in italics, "that a state of sensitization was fundamentally present, that it was related to disturbance of the endocrine functions and that the treatment of the given affection should be sought along these lines."

It is in this spirit that I have studied this condition. In other words, I have attempted to find the diathetic factor, hereditary or acquired, transitory or permanent, which determines this sensitization of the conjunctival mucosa. In the volume of the *Ann. d'Ocul.* for 1928 occurs a note[6] referring to cases of spring conjunctivitis occurring in children at the prepuberal period. For me these cases were specially interesting because they showed the dependence of the ocular condition upon the psychic and sexual developments immediately preceding puberty and also because they showed the beneficial effects of opotherapy.

I supplied Madame Delthil[7] with new cases, published in her thesis. One case was that of an American woman, some 40 years of age, affected with seasonal nasal and conjunctival crises ever since

undergoing a gynaecological operation producing uterine atrophy and almost complete amenorrhea. Another case featured similar disturbances, the patient in this case cohabiting with a cat since sudden and permanent arrest of menstruation at the age of 22 years.

A study of tuberculous allergy and its ocular manifestations shows clearly the allergic changes which the human organism may undergo through cosmic, climatic and meteorological variations under the action of the so-called "anergizing" infectious diseases, or under the influence of physiological variations in the humoral equilibrium as occurring in the hormonal crises of puberty, or of the menopause, or of the usual monthly phase of menstruation, or during pathological disorders in the activity of the endocrine structures.

However, it is by no means necessary to abandon sure and positive knowledge in favour of theories merely imagined. Only facts which are proven and unquestionable escape the risks of reasoning by analogy. All the cases whose essentials I have just pointed out have been published after having been followed up for a sufficiently long time and have the common conclusion as to the value of the sympathetico-endocrine abnormality and the interest inherent in opotherapy and hormonal treatment. Since 1922, the date of the earliest observations of non-infectious reactions of the conjunctiva, my attention has been essentially directed toward disturbances in the endocrine system.

B. *Sensitization.*—Anaphylactic sensitization, whose demonstration was possible after 1922, and supplied proof in place of mere hypotheses in ophthalmology, is another element which is common to all these cases. It permits non-infectious and non-bacterial reactions of the ocular conjunctiva to be placed in a special group, which includes affections like asthma or spasmodic coryza. The mucosae of the nose or the conjunctivae and respiratory tract are susceptible to the same pathological conditions. Since they are similarly exposed to similar influences, it is but logical to expect them to present similar, if not simultaneous, reactions. The association of these three types of reactions in the several mucosae is shown frequently in clinical work. As with the crises of asthma, those of the ocular conjunctiva are to be grouped with affections of anaphylactic nature, while some cases also show a relation between this group and urticaria and Quincke's disease. Still other cases, occurring more recently, have been subjected to the Prausnitz-Kutzner test for passive allergy.

C. *Experimental studies.*—Almost immediately following the clinical cases, experimental pathology has added arguments favouring interpretation of the facts as being of anaphylactic nature. In 1924, Alan C. Woods[8] concluded from his studies that the eye shares in the anaphylactic mechanism occurring generally

within the organism and that a local sensitization exists which is more marked if the releasing injection is made locally. Working with guinea-pigs, Bret Ratner[9] observed, in 1927, that if certain of the animals be previously sensitized and that if some of the latter be exposed to an atmosphere containing protein dust while others be injected parenterally with a liquid extract of these proteins, conjunctival hypersecretion appears in the animals of both groups, persisting for an hour and a half and sometimes still longer.

D. *Clinical confirmation.*—Clinical cases being rapidly added to those already mentioned are also of great interest. Among these must be included those of Lehrfeld,[10] in 1925, who noted five cases of vernal conjunctivitis, occurring in young people. He made skin tests in these cases with different proteins, some of the tests proving positive for ordinary fruits and vegetables, while others were positive for the proteins of hair and plumage of domestic animals. One of the interesting publications of Pasteur Vallery-Radot[11] reports true conjunctivitis replacing, and occurring at the time of, dyspnoeic crises in a case of asthma. Morenas[12] reports a striking case of conjunctival reaction accompanying the presence of oxyuris, compares it with a similar case obtained from the German literature and concludes as follows: "How can these facts be interpreted otherwise than as manifestations of verminous anaphylaxis?"

E. *The syndrome of so-called critical allergic conjunctivitis.*—These various labours have finally permitted the emergence of very exact ideas and the isolation of a definite and special syndrome. The latter presents the following characters:—

1. *Its nature* consists of pruriginous cutaneous or mucous reactions. They appear and cease abruptly, thus assuming the character of crises.

2. *The conditions under which the syndrome occurs* consist of identical climatic, seasonal or environmental circumstances.

3. *Pathological associations.*—A frequent co-existence or alternation of other anaphylactic signs, including dystrophic conditions, such as endocrine syndromes, developmental disturbances or disorders of puberty or of the menopause.

4. *Absence of infectious signs and the histological changes commonly occurring in follicular conjunctivitis.*—Bacteriological examinations are negative. Smears show no including cells, but a larger or smaller number of eosinophilic cells.

5. *Sensitization tests.*—Cutaneous or intradermal reactions are positive. So also is the Prausnitz-Kutzner test for passive allergy.

6. *Reactions to treatment and medication.*—Adrenalin and ephedrin act immediately and temporarily. Cessation of the action of the antigen acts immediately and durably. Opotherapy acts slowly and favourably. Desensitization is effective.

As with experiment, clinical medicine shows that two types of critical conjunctival reactions may be distinguished. To the first type belong reactions perhaps indicating local sensitization, since the crises occur always at the same site. Reactions of the second type are local and alternating or associated with other manifestations of the same morbid group, but are very variable in relation to the clinical syndrome of which they form a part (asthma, urticaria, Quincke's disease, etc.) and cannot be assigned to local sensitization.

Summary of the data

a. The individuals whom I have studied are dystrophic and attention is drawn to the effects of the dystrophies upon humoral equilibrium. In the cases I present, I note as far as possible the criteria of haemoclastic and blood-vascular changes.

b. The disorders in question are determined by sensitization to various antigens. In many cases this sensitization appears specific.

c. The sensitization mentioned cannot be identified with experimental anaphylaxis without explanation of certain contradictory facts which constitute problems in themselves, as follows :—

1. Why does the anaphylactic crisis never here immunize against a fresh anaphylactic shock?

2. Why do not slight and successive contacts (necessarily occurring in pollen anaphylaxis, for example) establish in medical anaphylaxis a state of resistance comparable to that shown by Bersredka in experimental or serum anaphylaxis?

3. Is there not often a contradiction between what we know of tact of a mucous membrane or the skin with some general substance anaphylaxis proper and cases in which frequent and repeated consuggests a mode of anaphylactic sensitization, although here there is not the incubation phase required for the production of the anaphylactic sensitization?

The complexity of these problems renders definition of certain basic ideas desirable, the usage and parallel descriptions for which they are employed requiring exact knowledge of the meaning of the terms anaphylaxis, allergy, receptivity, sensitization and idiosyncrasy. Three facts, of experimental nature, provide here the bases of definition :—

1. The anaphylactic phenomenon.
2. Protein shock.
3. Colloidoclastic shock.

1. *The anaphylactic phenomenon.*—An animal, injected for the first time with a heterologous albumin, in itself perfectly harmless, and left for some 10 days in repose for incubation, dies suddenly when receiving a minute dose of the albumin previously injected. Such is the phenomenon described for the first time by Charles Richet and Portier.

The effects accompanying the death of the test animal appeared highly striking to the earlier observers. Almost immediately after receiving the so-called releasing injection, the animal presents convulsions, posterior-tract paralysis, vomiting, diarrhoea and death. During this dramatic laboratory episode, examination shows marked humoral changes. The blood becomes suddenly incoagulable, the leucocytes disappear from the peripheral circulation and the blood pressure declines. This blood-vascular crisis constitutes the humoral proof of anaphylactic shock.

The fact has thus been established that, instead of immunizing, the first injection of a harmless substance such as albumin confers upon an animal organism permanent sensitization after a period of incubation. As expressed by Charles Richet, a memory of the first injection remains for ever. This test likewise proves that, under certain conditions, a substance harmless in itself may become lethal. Such are the phenomena of anaphylaxis and anaphylactic shock.

2. *Protein shock.*—Now, is humoral shock anything new and extraordinary? Has nothing of the kind ever been observed in the past by physiologists? Biedl and Krause, Arthus, and Nolf have shown that, during the past half-century, the records of the physiologists prove that identical effects have been observed following intra-venous injections of tissue extracts, egg-white, peptone or any heterologous albuminoid. The test animals died in the same way as with modern tests. The same humoral crises occurred (decline in blood pressure, incoagulability of the blood and diminution of the leucocytes in the peripheral blood) and the same clinical signs (convulsions, posterior-tract paralysis, vomiting and diarrhoea) were noted preceding sudden death.

Anaphylactic shock thus presents nothing very extraordinary. As Arthus expressed it, the shock appeared as a manifestation of *proteotoxy*, that is, as a sign of intoxication assignable to some specially toxic property of the albuminoid molecule, designated by Charles Richet in anaphylaxis as *apotoxin*. However, anaphylaxis continued to remain fundamentally interesting.

The discovery of Richet consisted in the proof that humoral shock may be fatal without any previous sensitization, but that it must be produced under such conditions by the *intravenous* injection of a large dose of the heterologous albumin, while the same effect may occur by the *subcutaneous* injection of a very

minute dose, provided the test animal be sensitized some days before with an inoculation of the same substance, not at all toxic in itself.

3. *Colloidoclastic shock.*—Fernand Widal proceeded to examine the question of toxicity. Clinically, any form of intoxication has specific characters peculiar to each of the known toxins. Veronal poisoning is unlike that produced by mercuric chloride or strychnine. Now, do substances essentially harmless as far as known, such as organ extracts, peptone or egg-white, really become toxic under certain conditions? And, if they do become toxic, should they not produce the same toxic disturbances and organic changes?

Charles Richet had shown the relations between anaphylaxis and immunity by proving that, when an individual has overcome the releasing injection he may then with impunity receive injections of enormous quantities of the substance which should theoretically prove fatal, the shock having suddenly annulled the state of anaphylaxis. How could this fact be reconciled with the idea of intoxication and what was known of intoxication?

Such were the major reasons for causing Widal to doubt the existence of toxicity in the problem. He approached the experimental problem by suggesting to his more intimate associates that, at the moment of the releasing injection, some *physical* action must occur within the organism capable of returning to the normal immediately or almost immediately after being created. Experiments were, therefore, undertaken under his direction attempting at first to produce states of humoral shock with substances other than heterologous albumins, which were at the same time quite atoxic. These tests showed that abrupt injection into the veins of a substance like an isotonic solution of sodium bicarbonate or chloride produces a shock indistinguishable from protein shock. Such sudden intravenous injection produces changes in the coagulability of the blood, diminution of the leucocytes in the peripheral blood, a shiny appearance of the blood and this humoral shock is followed first by a chill and then by a marked rise in temperature, and vomiting or even diarrhoea may occur. A decisive advance had thus been made.

Among these special conditions which he was so capable of interpreting, a study of paroxysmal haemoglobinuria supplied Widal with a new argument. In the crises of haemoglobinuria produced by exposure to cold, he showed that the haematuria was determined by something other than haemolysis. He observed that urticaria often develops while the individual is being chilled, that there is always a chill followed by rise in temperature, rachialgia and vomiting, and that these clinical signs of shock are inseparable from the humoral and haemoclastic crisis characteristic of shock.

Humoral shock may thus be produced not only by an injection of an isotonic solution of sodium chloride, but by merely chilling the individual. The resulting shock should not be, and could not be, distinguished from proteotoxic or anaphylactic shock or from the effects attributed to the apotoxin of Charles Richet.

In broad lines, such are the points which enabled Widal to affirm that specificity in a living being largely depends upon an individual condition in the humours created by colloids and that anything capable of altering this colloidal specificity is likely to produce the signs of a shock which may be termed *colloidoclastic.*

As soon as Richet's work became generally known, many theories were presented assigning various pathological syndromes to anaphylaxis. Such haste showed the universality of the discovery. However, I can scarcely believe that a real relation was established between experimental and medical anaphylaxis in publications other than those of V. Hutinel, in 1908,[13] Lesné, Dreyfus and Charles Richet, Jr.,[14] in 1911, on alimentary anaphylaxis, F. Widal on anaphylactic reactions in urticaria[15] and asthma,[16] in February and July, 1914.

A historical date was that of the case of asthma in a sheep vendor studied by F. Widal, Lermoyez, Abrami, Brissaud and Joltrain. By simply shutting up the man in a stable with his sheep a crisis of asthma was produced in the man, preceded by intense haemoclastic or colloidoclastic shock. As he had asserted the year before in connection with paroxysmal haematuria, Widal[17] showed that, in urticaria as in asthma, identity of these several types of shock depends solely upon a physical process, since the shocks occur under a wide variety of conditions, and that this process consists in a sudden upsetting of equilibrium in the blood plasma. "Many disturbances," he wrote, "heretofore assigned to intoxication, and others whose mechanism is not yet known, correspond very probably to sudden colloidal disequilibrium."

The cases of conjunctivitis alluded to above should be grouped with the studies made upon urticaria, Raynaud's disease, asthma and spasmodic coryza. The element of sensitization is evident in all these conditions, and colloidoclastic phenomena are frankly characterized. In most of my cases sensitization is of specific character, the conjunctival crisis being produced at will by the same antigen. Some of the cases, however, raise another question. For example, a patient whose case was imparted to Madame Delthil, experienced ocular disturbances for the first time while making a garment from American wool and the so-called "angora" wool. The symptoms recurred whenever she wore this garment. She had positive cuti-reactions with this wool and other samples

like it. The symptoms ceased only when she ceased to handle wool and woollen garments.

Possibly the case was one of incipient sensitization. Does it not bring up, in a different form, a question raised by the cases reported by Widal, Abrami and Jacques Lermoyez,[18] in which a crisis of coryza or asthma could be produced by a dose of aspirin, but for which intolerance developed after the first ingestion of the substance? Here the intolerance occurred under conditions such that it is not possible to consider this idiosyncrasy due to sensitization to aspirin.

I have recently observed a nine-year-old child who had a very evident conjunctival crisis, accompanied by suffocative signs, both being developed while the child was playing with a Siamese cat. The child often played with ordinary cats, but never presented and never presents now any such effects from contact with them. On careful investigation, we have proved that only the Siamese cat produces the crisis of asthma, coryza, and conjunctivitis, and have found that the child had known of no other cat of this species. The question arises whether this case is one of sensitization or of idiosyncrasy.

The problem of idiosyncrasy and its relations with the state of the organic colloids has remained unsolved for a long time. A particle of colloid appears ultra-microscopically as a group of molecules. Each of the latter contains numerous atoms, which form a complex whole. The complexity of the molecular structure permits a vast number of chemical combinations capable of being represented by stereo-chemical diagrams or formulae and also allows a huge variety of biological reactions. According to the place occupied by each atomic group with reference to the central nucleus, the essential part of the colloidal particle, various substances are or are not capable of combining with the colloidal complex.

Armand Gautier has taught that any substance must be capable of a stereo-chemical relation with some element of an organism in order to act upon that organism. Without such a relation, which may be considered geometric, between an organism and a medicinal agent, for example, no combination, and consequently no medicinal action, can occur. Speaking of such a combination, Fischer said that it is like the fitting of a key in a lock, an accord having occurred between the heterologous substance and the molecules forming the proper organic colloid. These facts show how the problem of idiosyncrasy is linked with the colloidal pathology which we are considering and how this problem extends widely beyond the earlier conception of anaphylaxis.

By this rapid review of facts interpretation of which we are seeking I wish to point out that, starting with experimental anaphylaxis

and having collected clinical cases in which sensitization seems unquestionably present, and having sought to learn what distinguishes auto-anaphylaxis, or spontaneous anaphylaxis, from the anaphylaxis of Charles Richet—I repeat that I beg to make it clear that there are cases in which sensitization appears native, constitutional, diathetic and quite independent of proved sensitization.

The conclusion of this survey is necessarily provisional. However, it is to the effect that pathological disturbances exist which are caused by sensitization, or susceptibility, of which the fundamental humoral test consists of colloidoclastic shock, a sign of the diathetic instability of equilibrium in the organic colloids. At present, this special susceptibility assumes three aspects, as follows:—

1. Specific sensitization, due to anaphylactic sensitization, similar to experimental anaphylaxis.
2. Specific sensitization produced allergically, in a way not resembling experimental anaphylaxis.
3. Non-specific sensitization, corresponding to diathetic instability of colloidal equilibrium and forming another group of allergic reactions.

Medical conceptions and theories are fated to be subjected to practical verification and therapeutic tests more immediately than is the case with other scientific productions. I have no need to defend such proofs. I need only allude to desensitization, constituting a test of sensitization, and to Ravaut's ideas[19] on secondary cutaneous sites of allergy, stated in connection with eczema and the Bruno Bloch phenomenon. These ideas have added fresh arguments to the general idea of sensitization.

I wish to close this discussion by mentioning the results obtained by acting upon the organo-vegetative nervous system by the treatment of endocrine disturbances. There are many reasons for considering of main importance the relations which have been shown to exist between the colloidoclastic diathesis and alterations in the endocrine functions. Therapy is already taking advantage of this point, considering that a relation between effect and cause exists.

In May, 1922, Widal, Abrami and L. de Gennes[20] and, again, Widal and Abrami[21] published a case in which crises of asthma were cured in a myxoedematous patient and again, in May, 1924, reported similar success in a case of hyperthyroidism. These facts may be grouped with details of a case of complex pluriglandular disturbances following surgical castration, reported in 1922. Here castration accompanied the typical paroxysmal syndrome occurring in the conjunctiva, and opotherapy acted beneficially both upon the ocular affection and the glandular conditions. The cases of mine which were published in Madame Delthil's thesis justify

the following conclusion: Recent studies have shown the influence of the organo-vegetative nervous system and of the glands of internal secretion in spring conjunctivitis. This affection occurs sometimes in adults, combined with disturbances in endocrine function, but it is more especially an affection of childhood and puberty which, contrary to other anaphylactic conditions, has a tendency to disappear as the equilibrium of the organism becomes established.

If it be true, as Renan wrote, that "scientific specialists do the most effective work toward mental progress," the study of certain blood-vascular conditions of the eye and certain critical changes in ocular tension have already shown that, in this phase of scientific effort the tasks of the specialists have a share in the general problem of biology. In closing, I beg to allude to what Ed. Joltrain[22] said, in 1933, in the Presse Médicale, with reference to emotion as a factor of humoral equilibrium, as well as to the discussion carried on during the preceding year by the Paris Ophthalmological Society[23] upon visceral pain associated with glaucoma. These brief comments serve to indicate that the new pathology, founded on the work of Fernand Widal, opens an unbounded prospect to specialized work.

The variety of clinical syndromes which this creative mind has pointed out for our study includes, for example, painful acrocyanosis, oedema, pruritus, erythema, paroxysmal dyspnoea, haematuria and other affections of the general kind which are such as to impress us with the inevitable necessity of revising ophthalmological syndromes in accordance with the fresh light emanating from Widal's views.

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TRACHOMA—RECENT ADVANCES AND THE PRINCIPLES OF PROPHYLAXIS*

BY

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A DISCUSSION of the social and legal measures which may be taken in different countries to reduce the incidence of trachoma, and to relieve the suffering and disability it causes, may be prefaced by a definition of what is meant by trachoma, and by a summary of the recent advances in our knowledge of the disease.

Trachoma is a specific contagious disease of the conjunctiva

* A report by A. F. MacCallan, President of the International Organization against Trachoma, read on April 3, 1935, at the Annual Meeting of the Organization held in London on the invitation of the Ophthalmological Society of the United Kingdom.

characterized by the new formation of lymphoid tissue which spreads to the cornea. It is followed by cicatricial changes in the affected tissues. It is chronic in nature.

The new formation of lymphoid tissue takes the form of follicles which may be present in several conjunctival diseases other than trachoma. Doubtful cases of trachomatous conjunctivitis may be decided upon by using biomicroscopical methods to detect corneal involvement, as shown by the characteristic vascular new formation at the periphery of the cornea. I drew attention to this more than 20 years ago (Trachoma and its Complications in Egypt. Cambridge University Press, 1913, p. 6).

It is of course impossible to apply biomicroscopical methods of examination to large groups of people, as when preparing statistics of the incidence of trachoma in a town or district. Many slight or early cases of trachoma must therefore be missed, and all geographical statistics must be greatly understated.

Recent Advances

The aetiology of trachoma is uncertain. It has not been proved to be of bacterial origin. Possibly it is a virus disease as it resembles other known virus diseases, such as psittacosis, in the exhibition in epithelial cells of inclusion bodies which are indistinguishable from similar bodies constantly present in virus diseases.

These cellular inclusions, which may also be found extracellularly, were first observed in the island of Java by Prowaczek and Halberstaedter in 1907 in a case of trachoma, and in the conjunctiva of an ourang-outang inoculated with scrapings from the human case. My late revered friend Axenfeld believed in them as the aetiological cause of trachoma, though, in 1914, he had no knowledge of virus diseases.

In his introductory address to the Ophthalmological Society of the United Kingdom in 1931, Perdrau, of the National Institute for Medical Research, remarked that the presence of inclusion bodies is not necessarily evidence of the action of a virus, and that they have been produced in the rabbit's cornea by physical agents, such as ultra-violet rays (*Trans. Ophthal. Soc. U. K.*, 1931).

Thygeson of Iowa, who first drew attention to the similarity between the cellular inclusions of trachoma and those of true virus diseases (*Arch. of Ophthal.*, Vol. XII, 1934), has obtained certain of their constituents (elementary bodies) in sterile filtered and centrifugalized suspensions. There is still lacking, however, the conclusive evidence of the specific infective power of these filterable bodies. Until this is demonstrated final judgment must

be reserved. (Private communication from Hardy Eagles of the Lister Institute of Preventive Medicine.)

While in my experience uncomplicated trachoma is chronic, both in its onset and its course, a subacute form in which inclusions can easily be detected, but in which pathogenic bacteria are absent, has been described.

There is a form of ophthalmia neonatorum in which pathogenic organisms such as gonococci or streptococci are absent, but in which a careful scraping of the conjunctiva reveals the presence of inclusions in epithelial cells. Special staining methods must be used and a long search under the oil-immersion lens of the microscope may have to be made. This ophthalmia neonatorum with inclusions is a highly important clinical entity.

Inclusion bodies may also be detected in a certain form of conjunctivitis contracted by men in swimming baths. An exactly similar variety of conjunctival inflammation is occasionally met with in men who have never entered a swimming bath.

It may therefore be said that in a doubtful case of trachoma the presence or absence of inclusion bodies is not of diagnostic significance, and we have to depend on our clinical examination.

We owe the clarification of our ideas on these various forms of conjunctivitis to an important monograph by Morax (*Bull. Soc. Franç. d'Ophtal., 1933*).

Owing to the fact that inoculations of trachomatous tissue from man into monkeys of various species never leads to trachomatous invasion of the cornea, as is invariably the case in man, there was until recently a doubt as to whether or not this experimental conjunctivitis was really trachomatous. However, Julianelle and Harrison have shown that this is the case (*Amer. Jl. of Ophthal., June, 1934*).

Principles of Prophylaxis

In addition to these two difficulties, uncertain incidence and uncertain aetiology, there is in some countries a much greater one, the acute inflammation of the conjunctiva caused by bacterial organisms, which either precedes infection by trachoma or is grafted on to an already existing trachomatous conjunctivitis. This form of conjunctivitis, and not trachoma, is responsible for the high incidence of blindness, as the result of corneal ulceration, which attains its zenith in Southern Palestine and in Egypt, but is of common occurrence in Algeria, Morocco, Tunisia, Arabia, Persia and Iraq.

The seasonal ubiquity of these epidemics of acute conjunctivitis, for they occur every year when the atmospheric temperature rises in May, June and July, demands special consideration.

There is usually overcrowding in the villages, terrific dust-storms damage the eyes, absence of sanitation permits the breeding of innumerable flies which may convey infection, while the shortage of water, even for drinking purposes, is often serious. It should be realized that while these conditions persist there will always be trachoma and acute ophthalmias causing blindness, as there always has been for the last 5,000 years.

Egypt differs from other countries in the above category in that she is rich enough to provide ophthalmic clinics and develop propaganda for ocular hygiene on account of her immensely valuable cotton culture. Also there is no shortage of water, so that during the last 30 years the incidence of blindness has diminished very greatly, and will go on diminishing.

Desiccated countries such as Southern Palestine and Southern Tunisia, which are excessively poor, offer a heart-breaking task to the civil administrator. In Algeria an admirable organization for the relief of sufferers from conjunctival diseases has recently been proposed by Dr. Lansnet, Inspector General of the Department of Public Health, and it will be interesting to observe what success is obtained after the lapse of some years.

For Southern Palestine Dr. Strathearn has proposed a campaign against eye diseases which has the sympathy of the Palestinian Government.

I am inclined to think that in similar poor countries the issue by the Government of eyedrops, such as solution of zinc chloride 0·5 per cent., or zinc sulphate 0·5 per cent., in convenient bottles, would do a great deal to prevent the worst ravages of ophthalmia. It would be necessary to see that the issue was abundant, and that the local agents for distribution made no illegitimate profit out of the affair.

In these countries the influence of intercurrent diseases causing debility, such as malaria, ankylostomiasis and bilharziasis, is important in causing lack of recuperative power in the individual attacked by ophthalmia with corneal ulceration.

It has been necessary to lay particular stress on the acute ophthalmias which complicate trachoma in a few countries, since they are responsible for the heavy incidence of blindness which obtains there. However, in the great majority of countries where trachoma is endemic the disease begins insidiously and pursues a chronic course.

In countries where trachoma is a common disease, infection occurs in the family life at home from an infected mother or servants, it is only rarely that a child becomes infected at a day school. But boarding schools are a very different matter. The admission of a child with trachoma to a boarding school may result in a mass infection of the pupils. It is, therefore, incumbent on

the principals of boarding schools to exercise care in the admission of new pupils from trachomatous countries. Institutional trachoma has practically died out in England, but is still a serious matter in Ireland.

There are certain games or sports which tend to the dissemination of trachoma if a single player of a team is infected. One is Rugby football, and the other is wrestling. It is not generally known that nearly all professional wrestlers have trachoma.

Sporadic cases of trachoma do occur in England. I have under observation at the present time two medical practitioners with the disease, neither of whom has ever been out of England, and neither of whom has ever seen a case of trachoma, as far as his knowledge goes.

It is perhaps superfluous to remark that a patient may have well-marked and highly infective trachoma without showing any obvious sign of the disease until the upper lids are everted.

Within the last few days a boy from one of the great public schools of England was brought to see me. He had been living with his parents in British territory abroad, and had attended a school for British boys where there had been a small epidemic of what was called "pink-eye." He complained of wateriness of the eyes and of so much disability that his parents took him to two different ophthalmic surgeons for opinion. Neither of them everted the boy's upper lids and so did not recognize the condition. The parents, being unsatisfied, took him to another ophthalmic colleague, who, on everting the lids, at once recognized the condition, but asked me to confirm his diagnosis of trachoma, which I did.

Trachoma may be a very mild disease causing little inconvenience. I have under my care at the present time a medical man with undoubted trachoma who suffers not at all. I have carried out mechanical treatment or grattage under local anaesthesia without causing any pain, and under mild treatment, which he applied himself, is gradually improving from stage IIa to stage III.

In some parts of Northern India trachoma is practically universal, but progresses to a quiescent stage which produces little disability. Soldiers recruited for the Indian Army from these parts serve efficiently throughout their colour service and have not proved a danger to the British troops brigaded with them. (Annual Report of the Public Health Commissioner with the Government of India, 1931, Vol II, p. 36.)

The freedom from complications is due to the cleanly habits of a people who have abundant water for ablutions, a temperate climate and sanitary habitations.

It must therefore be remembered that trachoma is not necessarily a devastating disease.

I need only indicate the principles of prophylaxis which I have described fully elsewhere (The Epidemiology of Trachoma, *Brit. Jl. of Ophthal.*, July, 1931, p. 393). They include personal prophylaxis, familial prophylaxis, school prophylaxis, prophylaxis in the Army and Navy, national prophylaxis and international prophylaxis.

Personal prophylaxis means the advice which should be given to anyone who is about to take up residence in a trachomatous country. Advice given should include a warning not to rub the eyelids with the fingers, and to wash the face and eyelashes at least twice a day.

Prophylaxis in the family.—A trachomatous mother is a grave danger to her newly-born child, and when possible some form of treatment, even if only antiseptic lotion or drops, should be applied. The use of handkerchiefs, towels and bed-linen which have been in contact with trachomatous persons is dangerous. Friends or servants with trachoma may readily infect a child whom they handle. In the heavily trachomatized countries where every member of the family and all the neighbours are trachomatous it can only be by a miracle that an infant escapes contagion. This is certainly true of the mass of the population. However, in the higher social grades in Egypt it is being found possible at the present time to bring up children without infecting them with trachoma. But here the housing, water supply and sanitation are good, while the mother and nurse have stage IV of cicatrized, non-contagious trachoma, or, if believed to be infective, undergo treatment by an ophthalmic surgeon.

School prophylaxis.—There are several reasons why it is advisable, where possible, to undertake a system of prophylaxis in schools. First a convenient gathering of young individuals is ready to hand; secondly, it is only by practical demonstration that an appreciation of the benefits of prophylaxis and treatment can be instilled; and thirdly, because efficient treatment carried out in the school will render the individual non-infective for any member of his family who happens to be non-trachomatous.

In Egypt I instituted an elaborate system of treatment and prophylaxis carried out by salaried ophthalmic surgeons whom I had trained. During the last year in which I was responsible for Egyptian ophthalmology (1923), out of 6,820 pupils there were at the beginning of the school year 31 per cent. with the more contagious stages of trachoma, I and II, while at the end of the school year this had been reduced to 12·2 per cent. This may be considered a fair result considering the difficulty experienced in many cases of changing by treatment stage I into stage III of partial cicatrization.

I have referred elsewhere (Trachoma in the British Colonial

Empire, *Brit. Jl. of Ophthal.*, November, 1934; also *La Revue du Trachome*, October, 1934), to the admirable directions laid down in Canada for the guidance of medical men, not ophthalmic specialists, who supervise treatment in the Indian residential schools. Some simple treatment such as is there described has a great value in teaching the pupils something about the care of the eyes, information which they often pass on to the older members of their family. As has been previously stated, day schools are not an important breeding ground for trachoma.

Prophylaxis in the Army and Navy need not be discussed here.

National prophylaxis.—The spread of trachoma is favoured by poverty, dirt, bad housing conditions, absence of sanitation and defective or absent water supply. If these can be improved the plague of flies will be diminished. The provision of clinics and hospitals for the treatment of eye diseases is of great educative value, for if the head of the family has trichiasis-entropion as the result of trachomatous cicatrization, and can get no operative relief, he is not likely to bother much if his child has a slight conjunctival discharge caused by trachoma.

International prophylaxis.—Typically this is carried out at the ports of entry into Canada and into the United States of America. Here all immigrants undergo a stringent examination by skilled medical officers which includes eversion of the eyelids. All cases of active trachoma are refused admission.

The Objects of the International Organization against Trachoma

At the XIIIth International Congress of Ophthalmology held at Amsterdam in 1929, it was officially proposed by the President, Professor van der Hoeve, and seconded by the Honorary Secretary, Dr. Marx, that an International Organization against Trachoma should be formed for the study of all matters relating to the disease.

Professor de Grosz became the President and Dr. Wibaut the Secretary General. The first plenary meeting was held at Geneva in 1930 and was attended by 64 delegates from 32 ophthalmological societies of various countries. A meeting of the Executive Committee was held in Paris in 1931 when arrangements were made for important discussions at the XIVth International Congress of Ophthalmology at Madrid in 1933. These duly took place and were of great interest. In 1934 a joint meeting with the International Association for the Prevention of Blindness was arranged by Professor de Lapersonne, the President of the Association, when various communications of interest were made.

My object in enumerating the activities of our Organization is to attract your attention to the zeal with which Professor de

Grosz and Dr. Wibaut have carried out their honorary functions. Professor de Grosz, who has been the main-spring of the Organization, and Dr. Wibaut have travelled on its behalf to Geneva, twice to Paris, to Madrid and to London. We owe them our sincere thanks.

The aims of the International Organization against Trachoma were enunciated by Professor de Grosz. They were and still are our creed. They include the encouragement of collaboration among the different organizations which are fighting trachoma, the study of the geographical incidence of the disease, its gravity and its sequelae, and also the organization of meetings to elucidate the aetiology, the therapeutics and the prophylaxis of the disease.

In my opinion our most important function is the arrangement of periodical scientific meetings where the various problems connected wth trachoma may be discussed, not only by members of the Executive Committee, but also by others who have special experience of the disease or have devoted their energies towards the elucidation of its aetiology.

Since trachoma in some European countries is a rare disease, as is the case in England, little interest is taken in communications about the disease. The International Organization against Trachoma provides a society of initiates where any matter of scientific or therapeutic interest connected with trachoma may be discussed, and to which correspondence may be addressed.

There is no doubt that the importance of trachoma as a world-wide disease has been realised to a greater extent than was previously the case owing to the activities of the Organization against Trachoma, though general interest in the disease had already been awakened by the publication of "*La Revue Internationale du Trachome,*" under the auspices of Morax.

Although the programme of the XVth International Congress of Ophthalmology contains no provision for communications on trachoma I hope that special and adequate sessions will be arranged for this by the Executive Committee. This is especially the case since the meeting place is to be in Egypt, one of the classical homes of trachoma.

The funds of the International Organization against Trachoma are derived from subscriptions from various Ophthalmological Societies. They have been used sparingly for the administrative needs of the Organization. Fortunately there is still a small balance, but it is insufficient to endow any form of research.

In my opinion our object should be to retain our present organization, to remain closely in touch with the Executive Committee of the International Congress of Ophthalmology, and with our sister-association, the International Association for the Prevention of Blindness.

CORNEAL PITTING

BY

LIEUT.-COL. H. HERBERT, I.M.S. (Retd.)

IN the January, 1935, issue of the *Brit. Jl. of Ophthal.*, Dr. Busacca, of Brazil, has shown photo-micrographs of sections that, to his mind, embody the essential features of the upper marginal corneal depressions of old trachoma, which, owing to MacCallan's kindly insistence, have become known as "Herbert's pits."

Rather deep, localized proliferation of epithelium was much more in evidence than surface depression, which was minimal. But there was too much cellular infiltration from recent trachomatous recrudescence, for one to be able to recognize any close relationship between epithelial downgrowth and supporting corneal lamellae.

The contribution is very acceptable, though illustrating only one phase and one grade of a trachomatous development, seen not infrequently in old days in India.

From the text of Busacca's paper it is evident that some objection to the scope or extent of his claim has been raised by Pascheff. Bearing upon this question I should like to make some observations supplementing my sole published report on trachomatous pitting. That brief report was included in the paper on "Trachomatous Pannus and Associated Corneal Changes" in the *Trans. Ophthal. Soc., U.K.*, Vol. XXIV (1904), pp. 67 *et seq.* Thirty years ago the *Transactions* constituted our main means of publishing ophthalmological observations, and unfortunately their circulation abroad was very limited—evidently failing entirely to reach some of the countries where trachoma has been most widely spread.

Many of the trachomatous pits seen in Bombay were of quite low grade, certainly representing anatomical changes less advanced than those depicted by Busacca. In the darker skinned patients particularly they were thrust into prominence by an essentially and exclusively trachomatous pigmentation of the spots, that deserves more attention than it seems to have received.

The colouring was sufficiently general to justify the common designation "pigmented pits" used there. And it helped decidedly in the clinical study of pitting. It was a curious thing. Though occasionally wanting in pale skinned patients it was more often, on the other hand, excessive in proportion to the loss (apparent or real) of tissue.

For instance, in No 13 of a collection of outline drawings published with my paper (on p. 70, *Trans. Ophthal. Soc., U.K.* 1904,) a number of small pigment spots are to be seen within the

upper corneal border. In this case the central spots alone were at all depressed, and even this depression was relative only—not real. The surface level of the spots was that of the normal cornea below, contrasting with the slightly opaque level surface above and between the spots, which was raised a little by the remains of old pannus thickening.

Pigment spots along the upper corneal border never occurred in my experience entirely unassociated with some pitting there. The strength of the connecting link between the two trachomatous features—pitting and colouring—was to this degree emphasized.

On the other hand the elasticity of the link was illustrated in No. 16 of the outline drawings, above mentioned. Associated with shallow depressions in the usual position, above, there was a row of seven somewhat unevenly distributed dark spots within the lower corneal margin, all minute and sharply defined. They were smaller than the smallest pits, and placed where neither pits nor trachoma follicles are ever seen, in my experience. I do not remember any other similar cases, and have no explanation to offer.

On p. 74 of the volume referred to, the lowest recognizable grade of old pannus remains is described as a slight "extension downwards of the normal upper marginal opacity that represents overlapping sclera and conjunctiva." And in No. 12 of the collection of drawings the lower ill-defined border of such minimal inactive pannus is shown interrupted by a few "small sharply defined semicircular indentations or bays," neither depressed nor pigmented, and showing the normal corneal transparency.

To quote further from this p. 74: "In cases where the abnormal corneal opacity has extended a little further downwards, in place of these bays . . . . we find fully enclosed round islands, less opaque than their surroundings. On careful examination they are found to be slightly depressed below the neighbouring surface."

This barely perceptible depression was undoubtedly in many cases merely the relative pitting of my old Figs. 12 and 13, above mentioned, leaving the true corneal level practically untouched. But these minimal examples of pitting were firmly linked clinically by medium grades with the uncommon deep dark cups, depicted in a row of five, in my old Fig. 15. And it seems very probable now that among the lower and medium grade depressions there may have been cases related to Busacca's. More or less destruction of corneal lamellar tissue by trachoma nodules may have been made good by moderate downgrowth of proliferating epithelium.

The evidence that sufficed to fix the sites of the pits clearly and unmistakeably in the minimal and minor grades of pannus must be accepted also as applying definitely in the higher grades of corneal trachoma also, in which the situation of the limbus could

no longer be made out. Though the number of the depressions varied, their site was always, so far as one could judge, the same—purely corneal, limited to a single row immediately below the site of the normal limbus.

This point needs emphasis since Busacca, in his Fig. 1 marks the lower boundary of the "lunula" well below the lower edge of the pit, instead of about its upper edge, where I think it should be marked. I took a good deal of trouble in those early days, examining a large number of upper corneal borders, both normal and otherwise, before settling this point to my own satisfaction.

There was an intriguing contrast between the very small marginal indentations of my old Fig. 12 and the corresponding isolated losses of tissue seen in the deep cups. The one seemed almost the direct negation of the other, since the sharply defined outlines and regular curves of the little indentations suggested points of especial corneal resistance to the spread of the diffuse wave of pannus. And one's natural impulse is—quite wrongly—to regard the later deep excavations as indicating points of earlier special activity of the disease.

A suggested explanation is the following:—In the matter of primary onset the only known anatomical structures likely to offer especial resistance at isolated points to a superficial wave of pannus are the minute rounded basal epithelial crypts at the limbus, varying in diameter up to 1/7th millimetre (B. Graves, *Brit. Jl. of Ophthal.*, Vol. XVIII, 1934, p. 338). The crypts are to be found in some eyes only. One can realize that deep epithelial attachments formed by the larger of these crypts may—like rocks in the bed of a stream—obstruct the downward lymph flow sufficiently to form sharply cut quiet backwaters below them, of some width, in which wandering cells may collect and multiply, forming colonies primarily superficial and flattened by the pressure of the upper lid.

The deeper pits represent the final results of long continued cellular activities as above initiated. Early follicular or nodular collections of lymphoid cells, characteristic of trachoma, have eaten their way into the corneal lamellae, and have later disappeared.

I remember seeing on two occasions only, lying at the bottom of a cup, a small defined pulpy greyish nodule or patch, which almost certainly represented the remains of lymphoid tissue. It had none of the appearance of active recuperative epithelial growth.

Such trachomatous cell collections are, of course, no more expressive of focal activities of the trachoma organism, than are the conjunctival follicles of many trivial types of conjunctivitis suggestive of focal microbial action. Yet in the destructive and cicatrizing disease alone—trachoma—are the cells able to erode

the corneal lamellae. Hence the pitting—representing isolated losses of tissue scarcely to be compared with the extensive and obvious destruction of tissue, that may spread through the greater part of the conjunctiva.

Concerning epithelial downgrowth generally in these cases, I should like to suggest two possible influences:—

1. On the whole it may be accepted that there was very little indication of epithelial activity in the Indian pits. There is no doubt at all that in some cases the pits remained entirely free from epithelial accumulation. I suggest that the explanation may lie in the fact that a very large proportion of our wandering patients had had little or no previous skilled treatment of their trachoma. There had been nothing to stimulate epithelial growth.

The average trachoma case in Brazil at the present day may receive the stimulus of fairly early and regular active (? caustic) treatment. Hence possibly the epithelial response as seen in Busacca's sections.

2. If my suggestion of the origin of the pits immediately below (not beneath) basal epithelial crypts should prove to be correct, the final epithelial proliferation should vary with the size of the original crypts. The larger and deeper the crypt the freer the epithelial response.

CASE OF BILATERAL EPITHELIOMA OF THE LIMBUS IN A BOY OF FIVE

BY

A. HUGH LOWTHER

MALAYAN MEDICAL SERVICE

THE following case is worthy of record on account of the early age of onset, and of the simultaneous involvement of both eyes.

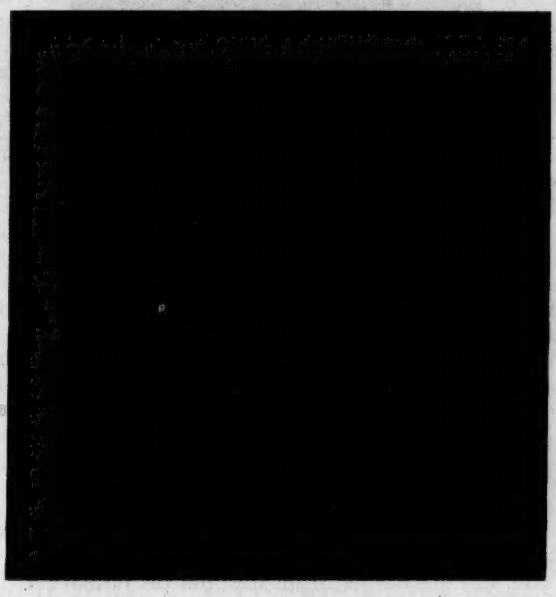
A Tamil boy, aged 5 years, first attended the Ophthalmic Department of Penang General Hospital on March 3, 1932, complaining of lacrimation, photophobia, and discharge from both eyes.

He had a severe conjunctivitis, and there was dense scarring involving practically the whole of both corneae.

The parents gave a history indicating that he had had an acute conjunctivitis four years previously, which they themselves had treated with "Nantiwalam" (a tropical flower, the juice of

which, I am told, is commonly used by these people for inflammations of the eye). The treatment was followed by the formation of extensive corneal capacities, and the eyes had been inflamed and troublesome ever since.

The boy continued to attend for some days, and treatment evidently produced some amelioration of symptoms, as he did



Enlargement of micro-photograph of tumour of right eye.

not attend again until November, when he returned with the same complaints as before.

On this occasion there was to be seen, in each eye, a greyish, raised, wart-like growth. The growths had overhanging edges and were symmetrically situated astride the limbus on the temporal side and in the horizontal diameter of each cornea. That of the right eye was the size of a three-penny bit, and that of the left slightly larger.

The tumour of the right eye was excised and sent for histological examination to Dr. Cowan, the Government Pathologist, who reported epithelioma.

Early in December, under general anaesthesia, the tumour of the left eye was excised and the base thoroughly cauterized with the

Enlargement of micro-photograph of tumour of left eye.

galvano-cautery. The site of the tumour of the right eye was cauterized at the same time.

The pathologist's report on the second tumour was again epithelioma.

The boy was discharged from hospital on January 9, 1933, and was seen again in August of the same year just before I left Penang.

There was no evidence of a recurrence. The condition evidently resulted from the long-standing chronic inflammatory condition.

I am indebted to Dr. J. C. Tull, Government Pathologist, Singapore, for the excellent micro-photographs.

AN EARLY OCULAR SIGN IN FACIAL PARESIS

BY

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THERE are many named signs of paralysis of the facial nerve. These are, however, observed only when the facial weakness is of such degree that no special sign is necessary to demonstrate its existence. The following sign is present at an early stage, often before any demonstrable asymmetry of facial movement, and is late in disappearing when the nerve is recovering its function, *e.g.*, in Bell's palsy.

Upward movement of the eye is naturally accompanied by contraction of four muscles:—superior rectus, inferior oblique, frontal belly of occipito-frontalis, and ***the levator palpebrae superioris***, the latter ensuring uncovering of the eyeball during upward movement. If a normal individual be told to "look upwards but keep the eyes closed," the stronger contraction of the orbicularis palpebrarum, in keeping the eyelids together, masks the contraction of levator palpebrae superioris. ***If there be any weakness of the orbicularis palpebrarum, it can no longer antagonise the contraction of levator palpebrae superioris and the eye tends to open.*** This degree of weakness occurs in the early stages of facial paresis, and late in the recovery stage. In the more marked degrees of facial paralysis where the orbicularis palpebrarum is grossly affected, no closure of the eyes is possible and the facial paresis is evident.

AN ADDITIONAL COMPONENT OF THE CONVERGENCE-ACCOMMODATION REFLEX

BY

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HITHERTO, the convergence-accommodation reflex has been described as possessing two clinically observable components,

1. Convergence of the eyes, due to the action of the internal recti,

and 2. Contraction of the pupil.

Observation shows that a third component must be added, namely,

3. Relaxation of the levator palpebrae superioris with consequent lowering of the upper eyelid.

The loss of this third component of the reflex is one of the earliest ocular signs in chronic encephalitic Parkinsonism and hyperthyroidism.

THE TECHNIQUE OF ADVANCEMENT AND OF TENDON LENGTHENING IN STRABISMUS OPERATIONS*

BY

W. B. INGLIS POLLOCK, F.R.F.P.S.

GLASGOW

DURING the last 11 years I have been employing for my strabismus operation, a slight modification of the usual advancement operation and also of Mr. Bishop Harman's tendon-lengthening technique. For cleanliness the eyebrows are shaved and the eyelashes cut short, while the surrounding skin is covered right up to the palpebral opening by sterilized towels and gauze, and I wear sterilized indiarubber gloves. In performing the advancement operation, I use only two silk sutures to advance the muscle. These I do not now ligature to the muscle; they only hold it with a modified clove-hitch. One of the two stitches is made to pass through the other one at the centre of the muscle to prevent the tendon splitting in two.

The drawing of the hitch may be difficult to understand, but the proceeding is roughly this:—The first needle *A* is entered

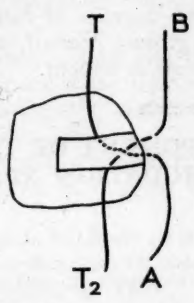

FIG. 1.

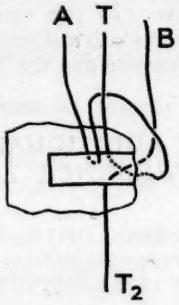

FIG. 2.

from above the tendon is passed behind it, care being taken to include all the deeper fibres of the muscle or tendon, and is brought out in the middle of the tendon as far back as is necessary. It comes through the conjunctiva at the posterior margin of the opening in the conjunctiva. A similar stitch *B* is inserted from below the tendon, and brought up slightly above the first stitch

* Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

which has not yet been hitched. The first needle *A* is again placed in the needle holder and held by the right hand. With the left hand, the terminal end of the stitch *T* is raised, which is kept taut. The needle is then passed behind the terminal *T* portion from below, is carried above it and inserted in front of it to take about one-third of the tendon from the surface and to come out on the under surface just a little in front of the terminal portion of the stitch. The stitch is again tightened, and the two ends are laid down on the piece of clean gauze which has been placed round the palpebral opening.

The lower stitch *B* is taken and the needle *B* put into the needle holder and held in the right hand, but the lower end of the stitch T_2 is lifted by the left hand and held firmly. The needle is passed behind and below the terminal portion, and again inserted into the tendon muscle, one-third from the edge and just in front of the terminal portion of the stitch, the needle being brought out to B_1 below the tendon. The stitch is then tightened and laid down below the eye. The needle holder is now laid aside, and the two stitches, the higher and lower including their terminal portions, are taken up in the left hand, while the right hand with a pair of scissors cuts the rectus muscle in front of the two stitches.

The usual procedure is then adopted. The eyeball is steadied by holding the tendinous insertion in the muscle with a strong pair of forceps, and the first needle *A* is entered into the episcleral tissue near the cornea. The lower stitch *B* is inserted in a similar manner. The assistant with a pair of hooks draws the upper stitch upwards and the lower stitch downwards, and the insertion of the portion of the tendon attached to the eye is excised. When the two stitches are tightened—one above and one below the muscle—the tendon is advanced from one-eighth to three-eighths of an inch, allowing for the amount which has been cut off as well as for its advancement to its new insertion.

As the original insertion of the stitches includes both the anterior and the posterior margin of the opening in the conjunctiva, it is obvious that when the stitch is drawn tight, the muscle is advanced and the opening in the conjunctiva is closed. The advantage of this procedure is that when the House Surgeon or Sister removes the stitch, one cut above the conjunctiva is sufficient and the whole stitch comes out without any cut being needed at the edge of the tendon under the conjunctiva.

A Modification of Mr. Bishop Harman's Operation

During the last 11 years I have also been employing for my strabismus operations a modification of Mr. Bishop Harman's tendon-lengthening, when it is required as an addition to the usual

advancement operation of the opposing muscle. In his well-known operation, he exposes the tendon to be lengthened, and places a small plate under the muscle on which millimetres represent an approximate angle of rotation of the eyeball. The tendon is then divided on each side of the plate on the superior side, while the inferior cut is made on the plate. The conjunctiva is closed by sutures.

In my modification, the necessity for sutures is done away with because the entire procedure is done subconjunctivally. An opening is made through the conjunctiva above the superior margin of the affected tendon. A strabismus hook is next inserted and brought out below the tendon, where a second opening is made in the conjunctiva slightly behind the place where the hook is pointing. A second strabismus hook is inserted under the tendon so that its point appears above the tendon. The two hooks are then separated about 10 to 15 mm. The assistant holds the anterior hook while I keep the posterior one, and I place the strabismus scissors behind the posterior hook to give a peripheral cut at the vertical margin to at least half the tendon. The scissors are then moved and placed in front of the anterior hook, and a second vertical cut is made on the upper margin to at least half the tendon. The scissors are introduced at the lower margin of the tendon and a cut on the inferior surface between the two superior cuts is made. The inferior cut has to be lengthened or shortened according to the desired amount of rotation of the eyeball. In this operation a bandage to prevent haemorrhage is necessary, but no conjunctival stitches are required.

For advancement operations the conjunctiva must be free from bacteria, and when it is difficult to obtain absolute cleanliness, I sometimes do a tendon-lengthening operation on one or both internal recti for convergent squint; and the same for one external rectus in divergent squint. If more is required I wait until the conjunctiva is absolutely clean before advancing the opposing muscle, because an infected stitch means a slipped muscle and a worse strabismus than before operation.

Summary

During the last 11 years, I have been using a clove-hitch to attach the stitch to the rectus muscle for advancement operations. Two stitches are employed. The advantage of this procedure is that the only knot for each stitch is outside the conjunctiva. The muscle does not require to be exposed for removal of the stitch because one cut brings the entire stitch out.

In tendon-lengthening, I employ two hooks slipped through small openings in the conjunctiva—one above the tendon and the other below. The two hooks are then separated by 10 to 15 mm. Two cuts are placed at one side of the tendon—one in front of

the anterior hook and one behind the posterior. The intervening cut on the opposite side of the tendon is done between the two hooks; this proceeding, being subconjunctival, does not require sutures, and the dressing is only applied for 24 hours to arrest haemorrhage.

A NEW STRABISMUS FORCEPS

BY

G. HANDELSMAN

SENIOR HOUSE SURGEON, ROYAL EYE HOSPITAL

IT is well known that in operations for advancement Prince's forceps have been used for many years to hold the muscle involved. In my opinion these forceps do not permit of that light ease of adjustment which is desirable, nor are they easily manipulated.

Messrs. Weiss have constructed for me a simple pair of strabismus forceps based on the well known Spencer Wells' artery forceps—modifications include much lighter shanks more suitable for ophthalmic work, whilst the jaws angled on the edge at an angle of 45° are capable of light but variable pressure. These jaws are flexible and grooved in a direction parallel to the muscle fibres so as to avoid crushing them.

This instrument has been in use at the Royal Eye Hospital for several months and the main advantages have been found to be in the speed of adjustment and manipulation of the muscle which is subjected to little or no trauma.

ANNOTATION

Preventible Blinding Diseases of Childhood

This is the title of a series of three Dr. Elizabeth Matthai lectures given in the University of Madras at the end of last year by Lt.-Col. R. E. Wright, C.I.E., and printed in the journal of Madras University. Naturally the lectures deal with such affairs as primarily affect the population of the Southern Presidency and are a useful addition to our knowledge.

The first lecture deals with Deficiency Disease and Trachoma. The deficiency disease which accounts for so much preventible blindness in children in Southern India is the avitaminosis known as keratomalacia. Wright gave his audience a good account of the signs and progress of the disease. The main deficiency in the diet concerns vitamin A, but vitamins B, C and D are possibly also concerned. Wright estimates that approximately three per thousand of his hospital cases in the year investigated, which showed partial blindness of such a degree as seriously to interfere with the earning capacity in after life, were due to keratomalacia. Treatment by crude cod-liver-oil has proved the most serviceable method in his hands, and he finds that a small dose in the form of an emulsion (for small children, 7½ minims) usually works well. In very marasmic infants who are too ill to take cod-liver-oil by the mouth or to tolerate it by the intestinal tract it has been found possible to save life by wrapping the child in a flannel binder soaked in cod-liver-oil.

Trachoma was linked with deficiency disease in the first lecture for convenience of spacing the subject matter. Wright gives some interesting percentages of cases under treatment for trachoma in

various parts of India. Thus, at Lucknow 24 per cent. of cases were being treated for trachoma; at Lahore, 50 per cent.; Bombay, 14·5 per cent.; Madras Presidency, 3·5 per cent.; Burma, 75 per cent. He considers the figures for Burma greatly in excess of the true percentage. Wright condemns trachoma as "a disease of the great unwashed, who fug in frowsy overcrowded dwellings, at least these types and conditions appear to mark reservoirs of the affection."

The blinding effect of trachoma in childhood is relatively small.

The difficulties of prevention in a country like India are emphasized. Mysore would seem to be the most progressive state, and at Bangalore compulsory medical inspection of students in all grades of education is legislated for, and there are adequate arrangements for the treatment of cases in suitable centres, and for financial help to the needy and deserving for this purpose.

In India trachoma would appear to affect Mohammedans rather than Hindus; in Southern Indian Hindus it is more common in Brahmins. It appears to be commoner among Mohammedan women, and Wright has been informed by Col. Kirwan that it is relatively uncommon among Bengalis.

Wright does not refer to the fact that in Egypt and Palestine, centres with a very high percentage, it is not the trachoma *per se* that leads to so much blindness but trachoma + acute conjunctival infections. Does not the same fact prevail in India?

Wright's second lecture dealt chiefly with Venereal Disease.

Ophthalmia neonatorum is relatively uncommon in India and the attacks seem to be less severe than in the occident. The figures for the Government Hospital, Madras, for ten years, work out at about 2·1 per 1,000, a far lower incidence than occurs in keratomalacia.

Congenital syphilis, while fairly common in India, would seem to give rise to fewer ophthalmic complications than ophthalmia neonatorum. Small-pox is of course a frequent cause of blindness in the East. An interesting table analysing 726 corneal opacities seen in 1929 gives 59 as following small-pox; 2, ophthalmia neonatorum; 92, irritant remedies; 68, injuries; 54, ulcers from acute catarrh, phlyctenular, etc., conjunctivitis; 41, trachoma; 18, keratomalacia; 14, specific (congenital or acquired). Of 143 anterior staphylomata in the same year, 16 followed small-pox; 35, irritant remedies; 31, injuries; 6, keratomalacia; 53, untraceable.

Particularly interesting are the lecturer's remarks on the results of Irritant Remedies. "The ignorance and superstition which prevails is almost unbelieveable in this connexion." A large field for prevention is here presented; and it is to be hoped that the results of education, posters, leaflets and other propaganda will lead to better things. Wright's third lecture was on Hereditary Diseases.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM
ANNUAL CONGRESS, 1935

THE Annual Congress of the Ophthalmological Society of the United Kingdom was held on April 4, 5 and 6 at the Royal Society of Medicine, London under the presidency of Mr. R. FOSTER-MOORE.

The President in his opening address to the congress said that it had been his intention to give his "accumulated evidence and settled conviction that apart from miliary tubercules of the choroid intra-ocular tuberculous lesions of any kind are very rare." He deprecated "the marked tendency in many quarters to attribute to the tubercle bacillus, many ocular lesions of unknown cause, on no satisfactory or convincing grounds." However, he felt that a subject with constructive features would be more helpful than one containing destructive criticism so had chosen to speak about the value of radium in certain intra-ocular lesions.

The President described the indications for radiotherapy in intra-ocular diseases such as glioma retinae, sarcoma of the choroid, haemangiomatosis retinae and retinal detachment. The results of his work with radon seeds in the treatment of glioma retinae affecting the second eye of children thus afflicted have fully justified the recommendation of radiotherapy to such cases where there is sufficient healthy retina remaining for some useful degree of vision to be conserved. For small neoplasms a radon seed or seeds of appropriate strength attached to the sclera by suturing or by a special clip designed by the President, is the method of choice whereas for a more extensive neoplasm he recommends interstitial irradiation by inserting the radon seed through an incision in the sclera over the site of the densest part of the growth.

For sarcoma of the choroid he holds that irradiation is only justifiable in cases where either the other eye has been lost or its vision is very defective, or the patient has refused excision.

Irradiation by the application of radon seeds attached to the sclera over the site of areas of haemangiomatosis retinae resulted in the successful production of obliterative endarteritis of the dilated and tortuous vessels feeding the neoplasm and its subsequent disappearance.

The President spoke of his experience with radon for the treatment of retinal detachment and suggested that this therapeutic agent would also be worth an extended trial for cases of Eales' disease if the site of the bleeding point could be located and a

radon seed placed over this. He suggested that certain destructive cases of iridocyclitis should receive a trial with radiotherapy. Many interesting illustrations of the President's admirable work in this field were shown.

Sir JOHN PARSONS in proposing a vote of thanks alluded to the President's pioneer work in employing radon seeds for the treatment of certain ophthalmic disorders and paid a tribute to this valuable contribution.

An abbreviated account of the discussion on "Disorders of the blood and their ophthalmological complications" is given in the abstracts of papers published in this number.

Thursday afternoon was devoted to a number of papers. Three of these concerned the much discussed problem of the surgical treatment of retinal detachment. Dr. MARC AMSLER dealt with methods of localizing retinal tears before and during operation and commented that no apparatus however perfect will ever dispense with the necessity for a thorough, minute and complete clinical examination.

Dr. LEON COPPEZ spoke of his experiments with pyrometric diathermy in which a pyrometric electrode measured the temperature of the coagulated tissue at the moment the eschar appears on the sclera in scleral diathermocoagulation.

Dr. Coppez commented that the temperature of a tissue which is being heated by diathermy cannot be calculated by simply reading the intensity of the current but only by reading the temperature itself.

Dr. MIKLOS KLEIN gave an interesting account of his researches into the physics of diathermy coagulation. By measuring the electrical resistance in eyes subjected to varying strengths of the diathermy current in the micropuncture method, surface coagulation and using the pyrometric electrodes he was able to work out a reasonable dosage and to assess the method of choice for treating cases of retinal detachment. He favours the micropuncture with micro-pins employing a current of 35 milliamps. for 2-3 seconds during the insertion of the pin.

Friday, April 5.

Mr. E. F. KING contributed an interesting paper on a rare condition, periarteritis nodosa which showed changes in the retinal vessels characteristic of this disease, papilloedema followed by optic atrophy in one eye and recurrent attacks of sub-acute uveitis and retinitis followed by secondary glaucoma in the other eye, which eventually had to be excised. Biopsy examination of the small and medium arteries of skin and muscle confirmed the

diagnosis. The excision of the glaucomatous eye gave the opportunity for pathological examination of the retinal vessels. Disease of the retinal arteries is apparently an unusual complication of this disease. In King's case there were no characteristic changes in the anterior parts of the uveal tract.

Mr. C. DEE SHAPLAND and Dr. J. G. GREENFIELD read a paper about a case of neurofibromatosis with meningeal tumour involving the left optic nerve. Post-mortem examination revealed neurofibromatosis in the skin of the lumbar region, the right fronto-cerebellar angle, the left acoustic and trigeminal nerves, the roots of the cauda equina and some of the dorsal root ganglia, and meningiomata affecting the inner surface of the dura over the vertex and along the falx cerebri, the base of the middle cranial fossa and left optic nerve sheath, and along the 3rd and 9th thoracic and 2nd lumbar segments of the cord. Dr. Greenfield commented that in von Recklinghausen's disease where there are multiple skin lesions the central nervous system is relatively unaffected. In the case reported he suggested that the tumour in the optic nerve sheath was secondary to the neoplasm in the skull.

In the discussion that followed Mr. HUDSON spoke of the pathology of endothelioma (psammoma) and asked whether the authors of the paper considered that the growth in the optic nerve sheath was a true neoplasm or a degenerative overgrowth. Professor VAN DER HOEVE in discussing the differential diagnosis asked whether the optic foramen had been X-rayed and spoke about the possibility of matastases in the optic nerve sheath, congenital aberrations and tuberose sclerosis.

Miss IDA MANN contributed a most interesting paper on "A theory of the embryology of oxycephaly." The clinical features of oxycephaly and its distinction from other deformities of the skull were reviewed and aetiological factors other than those based on the grounds of embryological anomalies were briefly examined and abandoned. Failure of full development of the alae sphenoid and temporal bones formed from visceral mesoderm explains the abnormality seen in the base of the skull in oxycephaly. An explanation of the cause of optic atrophy is afforded by the possibility of kinking of the optic nerves as they pass forwards and upwards from the depressed middle cranial fossa to reach the optic foramen. A corresponding upper visual field defect fits in with this conception.

Mr. KEITH LYLE demonstrated a case in which such a field defect was present. Radiographs of the skull showed that the middle fossa was lower than the optic foramen.

Dr. WAARDENBURG discussed the case and spoke of hereditary factors in oxycephaly, the index cephalicus, varieties of oxycephaly and the association of this disease with other congenital anomalies.

Mr. CHARLES GOULDEN spoke of the absence of the occipital protuberances and the association of these defects such as syndactyly and cleft palate. He discussed the aetiology of optic atrophy in this disease.

Mr. FINCHAM illustrated his interesting paper on the mechanism of accommodation by photographs of the living lens and ciliary body in the case of a young emmetrope who had suffered traumatic aniridia. The apparatus was so arranged that photographs of the lens by direct illumination, slit-lamp and transillumination utilizing the fundus glow were obtained and recorded alterations in the sagittal and equatorial diameters, the surfaces of the lens and the ciliary body. Photographs were taken with the accommodation relaxed by the eye fixing an object at 6 metres distance and then in the accommodated state at another object 12.5 cms. away. The photographs showed quite conclusively the increase in the antero-posterior diameter and in the shape of the nucleus, the diminution of the transverse diameter and the alteration in curvature of the anterior and the posterior surfaces of the lens. The centripetal movements of the ciliary body in accommodation were also shown.

In the discussion that followed Mr. HUDSON enquired about the possibilities of cinematography in such a case; Mr. Goulden stated that this demonstration proved the Helmholtz theory to be true and Professor NORDENSEN said that quantitative proof and a careful trigometric survey of the surfaces of the lens was required to elucidate fully the mechanism of accommodation.

Mr. J. D. MAGOR CARDELL read an instructive paper about the use of polarized light in ophthalmology with special reference to its use in ophthalmoscopes. By this means it is possible to examine the fundus in diseases and opacities of the cornea and lens, a valuable asset to the investigation of such cases. Polarized light applied to the ophthalmoscope and slit-lamp was demonstrated in the Trade exhibition.

Mr. J. FOSTER presented much physiological and clinical evidence to support his contention that colour fields except for the purpose of scotometry have very little clinical value and are a waste of much time. He has made an interesting study of the colours used in field testing, of the conflicting results obtained by plotting such fields in varying degrees of illumination, of the wide variations in the normal and of the impossibility of assessing properly the results obtained in pathological cases.

Dr. RANSOM PICKARD in discussing this paper stated that he had found the red field variable but that in his opinion there was no great difference in the fields within a certain range of light. Using a 3 mm. white object he had obtained similar readings in 95 and 4.5 candle power of daylight.

The afternoon was devoted to a series of five minute demonstrations on scientific material and apparatus. Mr. J. Foster showed a device for securing binocular fixation when mapping central scotomata; Mr. F. W. Law an ultra-violet lamp; Sir Arnold Lawson visual test objects for young children unable to read letters; Mr. Leslie Paton an illuminated test type inside an attaché case for travelling purposes and bedside testing; Mr. Williamson-Noble a pair of bifocals with a bridge device for elevating the lower segment; Sir Richard Cruise a new series of stereoscopic training cards in which the child's attention could be arrested and maintained by a large yellow or brightly coloured object on a black background; Dr. Cameron a Cruise-Whittington stereoscope; Mr. Collyer Summers a small transilluminator for use in locating tears in cases of retinal detachment and a mobile perimeter for bedside use.

Miss CASS read several short papers for M. Lopez Enriques dealing with a projection device in determining the plane of retinal images; a modification of the slit-lamp arm employing mirrors to deflect the beam of light and change its course; and some excellent pathological sections demonstrating the presence of Hortega cells in the retina and vitreous in a case of retinitis.

Dr. G. ERLANGER gave an enthusiastic account of his successes in the treatment of keratitis, corneal ulcers, vascularized corneae, sclerosing keratitis and several intra-ocular lesions by ionization with zinc sulphate using a current of 12 milliampéres for surface application for 2 minutes and 15 minutes when a deep effect is desired. He spoke of his experiences with keratitis in dogs.

Dr. MIKLOS KLEIN demonstrated his apparatus for the localization of a retinal tear in cases of detachment of the retina and showed how this instrument could also be employed as a perimeter for bedside use.

The Bowman Lecture

Mr. C. H. USHER delivered the Bowman lecture on a subject in which he is a well recognized master. He chose as the title "A few hereditary eye affections." The lecture illustrated admirably the thoroughness and care which have characterized all his investigations and the honesty which he has brought to bear in assessing the scientific value of the facts he has collected from a wealth of material.

As an introduction Mr. Usher paid a tribute to the memory and work of Sir William Bowman. In the main the lecture concerned hereditary ocular affections such as choroideremia, retinitis pigmentosa, epicanthus and ptosis, gyrate optic atrophy and angiomatosis retinae. Pedigrees were shown illustrating the hereditary

characters of these diseases. It would be impossible in the brief space allotted for this report to do complete justice to this lecture which should be read as a whole to be appreciated fully.

In proposing a vote of thanks Sir John Parsons paid a tribute to Mr. Usher's tenacity of purpose and to the valuable results he had obtained. Dr. Traquair in seconding added appreciative remarks about the lecturer's persistence, enthusiasm and activity in the investigations of his subject.

Saturday, April 6.

Mr. E. B. ALABASTER contributed an interesting paper on the physiology of convergent concomitant strabismus. He confined his remarks to facts of special interest concerning the significance of suppressive, projection and synoptophore findings. This paper was particularly acceptable at a time when the scope of orthoptic training is under trial.

Mr. B. W. RYCROFT read a paper about the clinical significance of the influence of local extra-ocular factors on the intra-ocular pressure.

Mr. TUDOR THOMAS demonstrated the microscopic appearances of two eyes on which corneal graft operations had been performed which were obtained post-mortem, in one case 6 months after operation and in another 3 weeks after grafting.

Mr. S. SPENCE MEIGHAN's paper was of interest in showing that so far as his experience goes cervical sympathectomy for cases of retinitis pigmentosa fails to improve or arrest the progress of the disease. Recently some extravagant claims have been made for the beneficial results following this operation for retinitis pigmentosa and Mr. Spence Meighan's impartial and critical opinion will be appreciated at this time.

Mr. E. WOLFF contributed a paper expressing his views about the cause of amblyopia following gastric and other haemorrhages. He suggested that extreme lack of oxygen and resultant arterial spasm are responsible factors.

On Saturday afternoon a visit was made to the National Physical Laboratory at Teddington where many demonstrations of scientific and optical interest were on view.

Mr. N. BISHOP HARMAN has kindly contributed reports about the activities of the International Association for the Prevention of Blindness and the Government Reception at Lancaster House which will appear in our next issue.

The Dinner

The Annual Dinner of the Society was held at the Langham Hotel on Thursday, April 4. The President was in the Chair and proposed the health of the Society. He gave a brief outline

of the history of the Society from its initiation to the time of its cleavage from the Royal Society of Medicine and thence to the present day. He mentioned the establishment of its affiliated societies especially that in South Africa.

Mr. LESLIE PATON in proposing the toast of the guests commented on the importance of this toast on this occasion when the Society welcomed so many distinguished members of the International Ophthalmological Council, the International Association for the Prevention of Blindness, the International League against Trachoma, and also representatives of the Clothworkers' Company which had done so much to finance and support the National Prevention of Blindness Committee in this country. The chairman of this latter committee, Mr. P. M. Evans, the secretary, Miss Cracknell and Mr. Eager representing the National Institute for the Blind received a welcome. Among the distinguished guests from abroad Mr. Leslie Paton mentioned the names of Professor van der Hoeve, Professor Nordensen, Dr. Marx, Dr. Pfleger, Dr. Park Lewis, Mr. Carris, Dr. Churchill, Professor de Grosz, Dr. and Mme. Wibaut, Professor Marquez, Dr. Maziny Bey, Professor Terrien, Professor and Mme. van Duyse, Professor Franceschetti, Dr. Amsler, Professor and Mme. Zeeman, Professor and Frau von Szily, Professor Fleischer and Dr. Alvaro.

Among the English guests welcomed were Air Commodore Iredell representing the Defence Services and Sir Arthur Robinson from the Ministry of Health.

In replying to the toast of the guests Professor Nordensen spoke of the post-war history of the International Ophthalmological Congress and Sir Arthur Robinson of the part that the Ministry of Health was playing in the prevention of blindness.

Exhibitions

The Trade Exhibition was held in the College of Nursing adjoining the Royal Society of Medicine. The following firms of dispensing opticians and surgical instrument makers exhibited:—T. Bowing & Co., Ltd.; Clifford Brown, Ltd.; Clement Clarke, Ltd.; Curry & Paxton, Ltd.; C. W. Dixey & Son, Ltd.; Down Bros., Ltd.; Theodore Hamblin, Ltd.; Alfred Hawes & Son; C. Davis Keeler, Ltd.; Rayner (Rayner & Keeler, Ltd.); The Uni-Luxe Optical Co., Ltd.; John Weiss & Son, Ltd.; Carl Zeiss, Ltd. and H. K. Lewis & Co., Ltd., Booksellers.

This exhibition is a great feature of interest and affords a useful link between the ophthalmic surgeon and the producers of consulting room equipment, lenses and surgical instruments. A panoramic view of recent mechanical improvements in the professional armamentarium is made readily accessible by this exhibition and the

high standard of British workmanship is good to behold. A number of industrial firms and the Industrial Museum kindly lent a variety of protective devices used to shield the eyes of grinders, chippers, welders, ladlers and others engaged in occupations where the eyes may be endangered from exposure to flying particles, excessive heat and bright light. Helmets covering the entire head and neck, screens for the front and sides of the head and face, goggles and other objects of interest were on view.

Details about these exhibits can be obtained on application to Messrs. Theodore Hamblin, Ltd., Wigmore Street.

OFFICIAL ABSTRACT OF PAPERS

"Disorders of the Blood and their Ocular Complications." By SIR ARNOLD LAWSON.

A discussion on this subject was held 12 years ago. It is not necessary to review old ground therefore, but to examine fresh knowledge that has come to light during the last 12 years. Bacterial infections do not come within the scope of this discussion as the blood changes bear no part in the ocular complications. Long continued gross sepsis may, however, produce blood changes which have a peculiar significance with regard to prognosis and treatment, and this phase of blood change is mentioned.

It is highly probable that ocular haemorrhages seen in the primary anaemias are not directly due to the blood changes themselves, but to nutritional defects in the capillary endothelium set up by toxins, whereby the permeability of the endothelium is increased.

Strictly speaking, there are probably no ocular complications which can positively be ascribed directly to altered conditions of the blood. Assuming that toxins, the nature of which can only be surmised at the present time, are the primary agent whereby retinal haemorrhages occur in the primary anaemias we have an explanation why

1. They only occasionally occur.
2. They are only noted in severe cases.
3. They only occur as a late manifestation of the disease.
4. They are of bad prognostic significance.

They thus fall into line with the ocular changes seen in nephritis and diabetes, though these are of a different type. An explanation is also furnished of the rarity of haemorrhage in pernicious anaemia contrary to text books.

It is generally accepted now that chlorosis presents no special ocular complications beyond functional disorders associated with

a general loss of nutrition. No new facts have come to light with regard to leukaemia.

Several disorders of the blood, as apart from actual disease, have great ophthalmic interest.

Eosinophilia has a special interest because of its invariable local and general presence in spring catarrh. Eosinophilia is commonly present in many skin diseases and also in the hay fever group, which is essentially allergic in nature. It is suggested that spring catarrh is really a modified dermatitis and that its tendency to aggravation at certain periods of the year is allergic in character.

Monocytosis or increase in the large mononuclear cell count has great interest because it forms a characteristic feature of sympathetic ophthalmitis. The same feature is seen in the blood count of all protozoal diseases and sympathetic ophthalmitis is treated very successfully on the same lines as syphilis and malaria. Monocytosis seems to negative conclusively the tuberculous origin ascribed to sympathetic ophthalmitis by Meller. There is no special blood picture in tuberculosis and no monocytosis.

Eales's disease or juvenile vitreous haemorrhage is associated with considerable difficulties. Delayed coagulation is a common feature, and the cause of this needs further investigation. It is suggested that there may be some relationship between the vitreous haemorrhage and the epistaxis of adolescence.

The blood calcium is another elusive problem. Its influence on the coagulation of shed blood is well known, but nothing certainly is known with regard to any influence deficient blood-calcium may have on haemorrhage. A deficient blood-calcium is very common in diabetes, and when found in cases of diabetic retinitis may be one causal factor in the formation of retinal haemorrhages.

Delayed post-operative haemorrhage coming on without apparent cause about the third or fourth day after intra-ocular operations is an accident for which no explanation may be forthcoming. It occurs in the young as well as in the old subject, and has ruined many excellent operations. It is suggested that some cases may be due to an inherent defect in the constitution of the blood.

Stress is laid on the importance of *differential blood counts* by an expert. Ophthalmic surgeons seem often to fail to take advantage of this means of investigation. The knowledge to be gained nowadays has enormously progressed in the last 12 years and may be of great importance as regards prognosis and treatment.

Lastly, is is very doubtful if the eye is especially sensitive to toxins as is commonly asserted. Much has been written and little proved with regard to this point, and it is probable that the eye

is no more allergic than the ear, the nose, or the gastro-intestinal tract.

"Diseases of the Blood and their Ophthalmological Complications." By DR. H. LETHEBY TIDY.

Definition of diseases to be included; diseases of the blood in which ocular manifestations may be reasonably accepted as the direct result of the changes in the blood. Sepsis thus is not included.

Rarity of ocular manifestations as an important feature of such diseases.

Discussion of the origin of retinal haemorrhages in diseases of the Blood, and their relation to haemorrhages elsewhere. Special factors operating on retinal vessels.

Discussion of optic atrophy developing in post-haemorrhagic anaemia.

Consideration of ocular manifestations in special diseases of the blood: leukaemia, secondary anaemia, pernicious anaemia, haemorrhagic diathesis, erythraemia.

"Diseases of the Blood and their Ophthalmological Complications." By PROFESSOR E. C. DODDS.

The terms of reference have been assumed to include the effect on the eye of diseases in which there is an alteration in either the form or chemical composition of the blood. If the discussion were confined to the effect of the primary blood diseases upon the eye, so little is known that it would be regrettably limited. It is hoped, therefore, that it is justifiable to interpret them in their widest sense.

A very general review is given of the relationship existing between the eye and the blood and tissue fluids and the alteration in composition of the blood, and its effect upon the composition of the fluids in the eye, considered. The two diseases which produce perhaps the most significant alterations in the chemical composition of the blood are diabetes mellitus and nephritis in its various forms. In diabetes mellitus two phenomena strike the observer, the familiar soft eye of diabetic coma, and the alterations in vision occurring throughout the disease. Possible theories to account for these are reviewed. In nephritis the sudden loss of sight and the various types of retinitis are considered from a biochemical point of view.

The question of exophthalmos is reviewed from the modern standpoint and experiments described in which it is shown that the degree of exophthalmos is proportional to the concentration in the blood stream of the thyreotropic hormone. The application of these observations to a study of Graves's disease and the possible chemical explanations are discussed.

"Ophthalmological Complications in Diseases of the Blood." By DR. P. N. PANTON.

1. *Pernicious Anaemia.*—A short analysis of a considerable series of cases of pernicious anaemia observed before the days of liver treatment with a consideration of the relative frequency of symptoms referable to the eyes and changes found in the fundi.

A reference to cases of pernicious anaemia now undergoing liver treatment.

2. Some account of the relative frequency of chronic and acute myeloid leukaemia, chronic lymphoid leukaemia and primary erythraemia and some reference to the importance of ophthalmological complications in these conditions.

3. *Chloroma.*—A brief account of the cases met with in the last 28 years at the London Hospital with specimens of chloromatous infiltration of the orbit and blood films from the cases.

"How we stand to-day as regards Locating Tears in the Retina." By DR. MARC AMSLER.

A brief historical survey of the subject is followed by a discussion of advances in three directions:—(1) Localizing instruments; (2) diffuse therapeutic agents; (3) localization during operation. The advances are described, the greatest value being attached to electrical methods of operating (diathermy and cathode current) combined with localization during operation, but it is to be emphasized that no apparatus, however perfect, can ever do away with the necessity for a thorough, minute and complete clinical examination.

"The Treatment of Detachment of the Retina by means of Pyrometric Diathermy." By DR. LEON COPPEZ.

Scleral diathermocoagulation or surface coagulation seems to be the most logical method, but an important feature as regards the correct execution of it has failed, up to the present day, and that is the exact measurement of the diathermic effect.

Joule's law does not apply to diathermic currents. We cannot calculate the temperature of a tissue which is being heated by diathermy, simply on reading the intensity of the current, but only in reading the temperature itself.

The pyrometric electrode measures the temperature of the coagulated tissue at the right place and at the very moment the eschar appears.

We have thus for scleral coagulation an objective method of measurement, which enables us to study the diathermic effect, both on rabbit eyes and human eyes.

For a given temperature, the effect is always the same, whatever the conditions may be.

The pyrometric method is slow heating, each coagulation lasting 30 seconds. This is why it differs entirely from all other diathermic methods.

Presentation of two human eyes upon which coagulations have been done at different temperatures. Retinographies and anatomical sections.

"Some Researches into the Physics of Diathermic Coagulation." By DR. MIKLOS KLEIN.

By means of electric resistance measurement the following were tried:—(1) Micropuncture method; (2) surface coagulation method; (3) pyrometrical electrodes were investigated in comparison with the above electrodes.

On the basis of these experiments it was possible to analyse the proceedings of coagulation and to obtain some results concerning reasonable dosage.

Some suggestions as to the performance of the operation were obtained.

"Ocular Involvement in a Case of Periarteritis Nodosa." By MR. E. F. KING.

The manifestations of periarteritis nodosa are discussed. It is pointed out that the disease is a severe generalized infection, usually fatal, affecting particularly the medium and small arteries throughout the body, in which there occurs a coagulative necrosis followed by cicatrization of the vessel or aneurysm formation.

The clinical picture is necessarily varied, though the arteries in the kidneys appear to be the most constantly affected.

Details of a case are reported, the diagnosis of which was confirmed by a biopsy examination of skin and muscle, in which the vessels showed the characteristic changes.

During the course of his illness this man developed a marked papilloedema of one eye, which later subsided leaving considerable atrophy, and in the other eye recurrent iritis with secondary glaucoma, necessitating removal of the eye. Pathological examination of this eye revealed a marked sub-acute uveitis and inflammatory infiltration of the retina; in the latter the infection was particularly confined to the arterial walls and periarterial zones. While such a distribution of infection in the retina cannot be regarded as diagnostic of the disease it is suggested that the toxin is here showing the predilection for small arteries characteristic of periarteritis nodosa.

The literature of the disease is discussed, from which it appears that the usual fundus picture is renal retinitis coincident with a terminal nephritis. No report of undoubted papilloedema, such as was seen in this case, has been found. Nor has the onset of

acute iritis during the course of the illness been described. Changes characteristic of periarteritis nodosa have been reported in the ciliary vessels within the orbit, the circulus iridis major, and the choroidal vessels, and one case in which the retinal arteries were affected, but it would seem, from the limited number of eyes which have been submitted to examination, that involvement of the latter is rare in the ocular pathology of this disease.

"A Case of Neurofibromatosis with Meningeal Tumour involving the Left Optic Nerve." By MR. C. DEE SHAPLAND and DR. J. G. GREENFIELD.

The subject of this communication, a young woman, aged 22 years, first attended the Ophthalmic Department at University College Hospital on January 5, 1934. Her left eye had been "blind" for five years and had become increasingly prominent during the previous 12 months. She had been quite deaf in both ears for two years.

The right eye showed papilloedema with about 3 D. of swelling and its visual acuity 6/18 pt.; the left eye was proptosed forwards, downwards and outwards, showed an almost complete external ophthalmoplegia, the disc was swollen about 6 D., and was surrounded by a zone of yellowish dots and soft white lines and its visual acuity was no perception of light.

The case was admitted to University College Hospital and was later transferred to the National Hospital, Queen Square, where she died on December 9, 1934. The autopsy was performed by Dr. J. G. Greenfield, and at this were found:—

A small dermal neurofibroma was present in lumbar region one inch above the iliac crest. A flat pad of tumour was found under the scalp over the right parietal eminence. Numerous rounded tumours (meningiomas) none much larger than a hazel nut were attached to the inner surface of the dura mater, both over the vertex, along the sides of the falx cerebri, and on the base in the middle cranial fossa. The sheath of the left optic nerve was swollen to half an inch in diameter and was twisted in "S" shape in the posterior part of the orbit. These tumours were all meningeal fibromas and psammomas; that in the sheath of the optic nerve surrounded the optic nerve without invading it. In the left eye the retina was lifted off the choroid by exudation.

A large acoustic neurofibroma lay in the right ponto-cerebellar angle and there were smaller tumours in relation to the left acoustic and trigeminal nerves. Three psammomas lay against the third and ninth thoracic and second lumbar segments of the cord and several minute neurofibromas were seen on the roots of the cauda equina and in some of the dorsal root ganglia. Ependymal gliomas were found in the first and second cervical and tenth and eleventh thoracic segments of the cord.

"A Theory of the Embryology of Oxycephaly." By MISS IDA MANN.

After a summary of the clinical features of oxycephaly and its distinction from other deformities of the skull, the question of its aetiology is discussed. Various theories (rickets, syphilis, foetal meningitis, pre-natal osteitis) are examined and abandoned. The hereditary and familial cases collected by Allison Davies are examined and a theory based on the comparative embryology of the skull base put forward. The morphological value of the bones of the skull base is explained in terms of visceral and paraxial mesoderm and oxycephaly then seems explicable as a failure of the last acquired (visceral mesodermal) regions to develop to the full.

"A Study of Accommodation by Photography of the Living Eye and Ciliary Body in a Case of Aniridia." By MR. EDGAR F. FINCHAM, F.Inst.P.

The case which was studied was one of traumatic aniridia in a young man. The somewhat rare opportunity of acquiring direct evidence of the change in the form of the lens and the movements of the anterior part of the ciliary body during accommodation, made it desirable that photographic records of these processes should be obtained. Two methods of illuminating the eye were used; the transillumination of the media by light from the illuminated fundus, as with the ophthalmoscope, and the slit-lamp method. The eye was photographed in the unaccommodated and accommodated conditions under both types of illumination. An optical method of projecting the slit-lamp photographs to obtain a perpendicular view of the illuminated section was employed and is described in the paper. The photographs show that in accommodation the equatorial diameter of the lens is reduced, while its sagittal dimension is increased. The general change in form of the lens is seen to apply to the nucleus of the lens as well as to its external surfaces. A centripetal movement of the inner edge of the ciliary body in accommodation is also shown in the photographs. Measurements of the changes are given and the significance of the results is discussed.

"Recent Developments in the Use of Polarized Light in Ophthalmology with special reference to its use in Ophthalmoscopes." By MR. J. D. MAGOR CARDELL.

A short description of the properties of polarized light as they affect the examination of the fundus—the method of applying them in the ophthalmoscope—the advantages to be obtained therefrom.

Polarized light applied to the retinoscope and slit-lamp. Demonstration in the Trade Exhibition.

"A Note on the Clinical Value of Colour Fields." By MR. JOHN FOSTER.

1. There is a huge amount of literature on colour fields (which are still extensively used as a diagnostic measure). An attempt to obtain clinical standards from this literature has led the writer to the belief that colour fields have very little clinical value, and waste much time.
2. Summary of the clinical signs alleged to be found in pathological cases, and the conclusions drawn from them.
3. Ferree and Rand, and Wentworth, in strictly controlled testing to establish a physiological normal, have shown that the signs mentioned in the summary above can be found quite frequently in normal people.
4. Factors inducing the variation in normal people.
5. Classification of the signs elicited by colour fields with application of the above work to their interpretation.

"The Parallel Corneo-Scleral Suture in Cataract Operations." By MR. R. LINDSAY REA.

Various suture methods for the safety of the incision in cataract extraction have been described in the past. After some years of simple extraction experience, certain cases recently have led to the use of a method of suture which has proved very successful. The details are described.

"Remarks on the Physiology of Convergent Concomitant Strabismus." By MR. E. B. ALABASTER.

No attempt has been made to give a comprehensive survey of the whole subject. Facts of special interest to the writer have alone been dealt with. These include: Suppression; projection; findings on the Synoptophore, and the possible significance of such.

"The Influence of Local Extra-ocular Factors on the Intra-ocular Pressure, and their Clinical Significance." By MR. B. W. RYCROFT.

The extra-ocular factors which control the intra-ocular pressure are discussed and illustrated by experimental methods. Their bearing on local anaesthesia and intra-ocular operations is noted.

"Clinical Record and Histology of Two Successful Corneal Grafts in Man." By MR. J. W. TUDOR THOMAS.

One of the cases described in this paper was a man on whom corneal transplantation was performed in June, 1934, and who died six months later with 6/60 vision. The other patient died three

weeks after corneal transplantation, with a transparent corneal graft.

In each case the eye was obtained post-mortem for examination and the microscopic appearances are described and illustrated.

"Final Report of a Case of Retinitis Pigmentosa, treated by Cervical Sympathectomy, with notes on two other cases." By MR. S. SPENCE MEIGHAN.

At the Annual Congress of this Society in 1931, the author reported a case of retinitis pigmentosa, which had been treated by cervical sympathectomy, four months previously. At that time the operation had been followed by an apparent improvement in the visual fields, and visual acuity, and this had taken place in both eyes. It was realised that too short a time had elapsed since the carrying out of the procedure to draw any definite conclusions. This paper gives the findings in the case at the present time, four years after the treatment had been carried out, and also notes on two other cases, which have been treated in a similar fashion. It is shown in the original case, that the apparent improvement has not been maintained, and that the boy is much worse than he was in 1931, prior to cervical sympathectomy. In the other two cases, while one has shown and maintained a slight improvement in visual acuity, in both there has been a progressive contraction of the visual fields. This has been taken as showing that the disease process has not been arrested.

The temporary improvement, and its bearing on the aetiology of the disease are briefly discussed. The conclusion is arrived at, that in the author's experience, sympathectomy in retinitis pigmentosa fails to improve or to arrest the progress of the disease.

"The Causation of Amblyopia following Gastric and other Haemorrhages." By MR. EUGENE WOLFF.

The typical picture of small retinal arteries and a white disc is compared with those resulting from quinine and blocking of the arteria centralis.

It is suggested that these are all produced as the result of spasm of the arteries due to extreme oxygen lack.

An attempt is also made to explain the variability of the fundus picture by the amount of blood lost, the rapidity of recovery and the time of onset of the amblyopia.

ABSTRACTS

I.—STRABISMUS

(1) **Corrado. (Genoa).—Is there any relation between the degree of deviation and the optical and functional conditions in concomitant strabismus? (Sulla inconstanza dei rapporti fra grado dideviazione e condizione ottico-funzionale nello strabismo concomitante).** *Ann. di Ottal.*, October, 1934.

(1) It seems clear that there are many factors which enter into the causation of squint, and it is probable that the final solution of the problem is still to be found. The relation between the angle of deviation and the refractive error is a point that has been little examined. (The author has not come across Priestley Smith's Bowman lecture in Vol. XVIII of the *Trans. Ophthal. Soc., U.K.*, which deals with this point.) **Corrado** comes to the conclusion that there is no absolute relation between the refractive errors and functional power of the eyes on the one hand and the angle of deviation on the other. He thinks that the variable deviation may depend in some degree on the varying size of the macula in different subjects. If the macular region is small, a small deviation will remove the image in the squinting eye outside the area of distinct vision. With a large macula, the deviation must be greater; the varying degree of deviation will depend on the anatomy of the retina.

HAROLD GRIMSDALE.

(2) **Braun, G. (Prague).—The visual field in squinters. (Gesichtsfelduntersuchungen bei Schielenden).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCII, p. 600, 1934.

(2) **Braun** gives a short review of work on the subject and records 10 cases, mostly adult patients, in whom the fields were carefully studied. He shows that in alternating squint the fields are equal and normal. In unilateral squint the field is normal in the good eye, but in the squinting eye he demonstrated, by means of a 1 mm. object, a half-moon, absolute scotoma on the temporal side of the fixation spot; the poorer the vision, the bigger this defect is, even passing over the fixation spot in cases in which fixation is poor. The author argues that this field defect really represents a central scotoma, as an eccentric area has taken over the rôle of the fovea.

ARNOLD SORSBY.

(3) **Guibor, G. P. (Chicago).—A practical comparison of some instruments used in orthoptic training.** ***Jl. Amer. Med. Assoc.***, September 22, 1934.

(3) **Guibor** has prepared a list of the instruments commonly used in the United States of America and in England in so-called squint training.

He classifies them as follows:—

(1) Instruments depending on the use of prisms to produce the superposition of images.

(*a*) Stereoscope.

(1) Standard stereoscope (made in various models).
(2) Variable prism stereoscope.
(3) Training stereoscope.
(4) Kinetic stereoscope.
(5) Telebinocular.
(6) Stereophorometer.
(7) Keratometer.
(8) Phoriascope.
(9) Stereocampimeter.
(10) Correct-eyescope (made especially for drawing).

(*b*) Normalizer.

(*c*) Panocular.

(II) Mirror reflecting instruments to produce the superposition of images.

(1) Cheiroscope.
(2) Amblyoscope.
(3) Synoptoscope.
(4) Synoptophore.
(5) Stereo-orthoptor.
(6) Orthoptoscope.

(III) Combinations-stereocampimeter with mirror attachment.

(IV) Instruments depending on the projection of light forms on a screen to produce superposition of images.

"The assertions that such instruments overcome amblyopia more rapidly than may be done with other means certainly rest on no foundation whatever. No instrument will take the place of prolonged monocular occlusion and atropinization for this purpose, the effect of the latter procedures being limited to a certain percentage of cases, and chiefly to those seen at an early stage."

The article has been adopted by the Council on Physical Therapy and the Committee on Standardization and Drugs of the Section of Ophthalmology of the American Medical Association.

A. F. MACCALLAN.

(4) **Savin, L. H. (London).—Concomitant squint and its treatment.** (A post-graduate Lecture at King's College Hospital). *Lancet*, September 8, 1934.

(4) It is difficult to make an interesting abstract on the subject of concomitant squint. So much has been written about it and still we continue to make successes and failures. Of course, the mechanical straightening of an eye is a comparatively easy thing to do, but the obtaining of stereoscopic vision in most cases is not. **Savin** in his post-graduate lecture seems to make this quite clear. Perhaps the main point in his article is his insistance on the fact that amblyopia is an inhibition of vision and is entirely different from abolition of vision. Whenever we can, and the younger the better, we should try to recover the lost vision before operating, whether by regular orthoptic treatment or by covering the good eye. In infants the good eye can be atropinized. With regard to the latter the author prefers the home-made patch over the spectacle lens to the bought occluder, on the ground that the mother attends more to the home-made article's efficiency than to that of the bought one, which she thinks is bound to be right. The following quotation from this excellent article (it must be remembered that it is a post-graduate address) is of some interest as showing the author's doubtful faith in orthoptic treatment. "Not long ago I tested the binocular vision of three cases of squint operated upon two years before. Owing to circumstances, no training of the fusion sense had been tried before or after the operation. They had all acquired full binocular vision by the unaided exercise of their own eyes. I thought wistfully of how well they would have looked in my somewhat meagre statistics of successes under orthoptic treatment."

ERNEST THOMSON.

II.—CONJUNCTIVA AND CORNEA

(1) **Gallengo. (Turin).—Conjunctival and corneal lesions found in high altitudes. (Contributo biomicroscopico e sperimentale alla conoscenza delle lesioni corneo-congiuntivali in alta montagna).** *Rass. Ital. d'Ottal.*. September-October, 1934.

(1) **Gallenga** has tried to discover what part is played in the production of these lesions by wind, by cold, and by light reflected from the snow. For this he has made use of rabbits whose third eyelid had been removed.

It is possible, he says, to provoke an intense conjunctivitis, accompanied by a superficial turbidity of the cornea by exposing

animals to strong wind at high altitudes, even though the eyes are kept closed. There is a latent period after exposure of about 24 hours.

Exposure to cold alone will cause a condition of the cornea of epithelial turbidity and exfoliation similar in appearance to that often seen in glaucoma. This comes on without latent period and is due to increased evaporation and suppression of blinking. A high altitude is not necessary to produce this effect.

In high altitudes it is possible to reproduce actinic keratitis in rabbits by exposure to the light from the snow; this seems to be increased by cold, and the application of hot compresses during the latent period seems greatly to diminish the intensity of the attack.

HAROLD GRIMSDALE.

(2) **Friede, R. (Jägerndorf).—Variability of horizontal and vertical diameters and surface area of the cornea and sclera in megalocornea, normal cornea and microcornea. (Zur Variabilität des wagerechten und senkrechten Hornhautdurchmessers und der Oberflachengrösse der Hornhaut und der Lederhaut bei der Megalocornea, Normalcornea und Microcornea).**

The surface area of the cornea and sclera in the embryo, and in the new born, and their bearing on megalocornea of the adult. (Ueber die Oberflachengrösse der Hornhaut und der Lederhaut beim Embryo und Neugeborenen und ueber deren Beziehung zur Megalocornea der Ewachsenen).

Zeitschr. f. Augenheilk., Vol. CXXXI, pp. 132 and 213, 1933.

(2) **Friede** draws attention to the conflicting measurements on corneal diameters and records 10,940 measurements carried out with the Wessely keratometer; 5,064 were in men, 5,876 in women. The horizontal diameter varied from 13.5 to 9.7 mm., the vertical 13·0 to 9·0 mm. The arithmetical means were 11·56 and 11·12 mm. respectively for the whole series, and 11·55 mm. for the horizontal diameter in men as against 11·50 mm. for that in women; with 11·21 mm. and 11·07 mm. for the vertical diameter in the two sexes. The author also reports variations for the sclera. He holds that megalocornea is not to be regarded as a pathological disturbance, but is a biological variation frequently carrying with it a diminished surface area of the sclerotic.

In the second article Friede emphasizes this latter argument and points out that relative megalocornea is the normal condition in some lower animals, in the foetus and in the child. Megalocornea is not a localized gigantism.

ARNOLD SORSBY.

(3) **Clerici. (Pavia).—Rubbrecht's method of treating hypopyon ulcer. (Il metodo di Rubbrecht nella cura del cherato ipopion).** *Rass. Ital. d'Ottal.*, September-October, 1934.

(3) Rubbrecht's method of treatment consists in dividing the floor of the ulcer after cleaning it and covering with a flap of conjunctiva which is secured in place. In the series of very severe cases which **Clerici** has treated by this method, he records fair success.

HAROLD GRIMSDALE.

(4) **Rinaldi. (Padua).—Local action of the sexual hormones on the course of septic wounds of the cornea. (Azione locale degli ormoni sessuali sulle ferite settiche sperimentali della cornea).** *Boll. d'Ocul.*, September, 1934.

(4) The internal secretions of the sex glands have been shown to have the property of favouring metabolism, and thus aiding in the repair of lesions of the skin. **Rinaldi** has made a number of experiments to discover whether these bodies have any similar action on septic wounds of the cornea when applied locally; the subjects of his experiments have been both normal and castrated animals; he has found in no case any modification of the course of the septic wound.

HAROLD GRIMSDALE.

(5) **Galante, E. (Palermo).—Biomicroscopical study of the limbus in trachoma. (Studio biomicroscopico della regione limbare dell'occhio soggetti trachomatosi).** *Rev. Internat. du Trach.*, July, 1934.

(5) **Galante,** who is a lecturer in physiology at the University of Palermo, has made a biomicroscopical study of the limbal region in the normal and the trachomatous eye.

The vessels of the limbal region in the normal eye may be divided into three zones which from the periphery to the centre are the *palisade zone*, the *zone of marginal vascular loops* and the *zone of terminal capillary loops*. The latter two zones normally contain no blood. Where the curvature of the sclera merges into that of the cornea there is a primary groove which may be said to limit the palisade zone on the sclerotic side. Between the zone of marginal vascular loops and the zone of terminal capillary loops there is a secondary groove, the outline of which is indistinct.

In the trachomatous limbus the primary groove is occupied by a slight oedema which extends towards the cornea. The vessels of the terminal capillary loops are markedly developed in whorls. They may be interlaced to form a network from which fine capillaries are directed towards the centre of the cornea. In active

conditions of trachoma the zones of marginal loops and of palisades show congested vessels. The limbal vessels are encompassed by a well-marked halo which follows all their sinuosities, and is the expression of an intra-lamellar oedema. This shows that there exists in the limbal region of even the quiescent trachomatous eye a permanent source of irritation which any slight stimulus may excite. The perivascular oedema is succeeded by a cellular infiltration which, as in the conjunctiva, leads to the deposition of connective tissue. The limbal region gradually assumes a milky appearance with a trellis-like structure. The rosettes and pits of Herbert may be found, but are not invariably present.

A. F. MACCALLAN.

III.—MISCELLANEOUS

(1) **Tait, Charles B. (London).—Uveo-parotitis.** *Lancet*, October 6, 1934.

(1) "Uveo-parotitis is a definite clinical entity characterized by bilateral uveitis and parotitis, pursuing a chronic course with a well-marked tendency to spontaneous recovery." It was first described by Heerfordt in 1909 who considered it to be a complication of mumps. Garland and Thomson (who themselves wrote the opening statement) have recently stated that it should be known as uveo-parotid tuberculosis. They contend that their statement is based on the following evidence, *viz.*, post-mortem findings and biopsies with histological evidence of tuberculosis, iris nodules, focal reaction to tuberculin and tuberculosis of lung with positive sputum. Their cases number 22 altogether and the authors say "In more than one-third of the recorded cases we have incontrovertible evidence of tuberculous infection." Tait criticises this and says "Yet the composite picture of the signs of uveo-parotitis bears but a slight resemblance to tuberculosis."

ERNEST THOMSON.

(2) **Davies, T. A. Lloyd (London).—Uveo-parotitis polyneuritica.** *Lancet*, October 6, 1934.

(2) It is impossible to do better than to quote textually **Lloyd Davies'** opening statement as to the condition which he is describing. "Uveo-parotitis polyneuritica (febris uveo-parotidea of Heerfordt) is an uncommon syndrome characterized by inflammatory lesions of the uveal tract of the eye, enlargement of the parotid glands, facial palsy (commonly unilateral, but occasionally bilateral) and fever. The syndrome may occur at any age

(commonest in young adults and slightly commoner in females). Frequently there is a short prodromal period in which skin rashes may appear. In spite of the name given by Heerfordt, fever is not essential, many cases being apyrexial." The author gives a list of the principal cases hitherto described by authors of whom he appends a list of 19 names.

It will be noted that the author adds the title "polyneuritica" to "uveo-parotitis." This was a very marked symptom in the case described by Garland and Thomson (*q.v.*). One would like to quote the case in full, but as in the others, these reports contain so many facts that full quotation would occupy more space than can be given. It must suffice to state that the patient was a female, aged 25 years, and that the family history disclosed nothing relevant. The personal history showed that she had measles and chicken-pox in infancy. Mumps (which it is generally admitted has nothing to do with these cases) occurred at the age of 7 years. Five cases altogether are described in this and the other reports and they certainly form a most interesting quintet.

ERNEST THOMSON.

(3) **Garland, Hugh G. and Thomson, J. G. (Leeds).—Uveo-parotid tuberculosis.** *Lancet*, October 6, 1934.

(3) **Garland and Thomson** in reporting two further cases of this disease at great length—and to transcribe the cases would occupy too much space—give a summary of the condition, which itself demands fairly complete transcription. Most of the patients are in the second or third decades of life. Parotitis is constant and nearly always bilateral. The swelling is firm, nodular and painless, and subsides in a period which varies from days to months. Bilateral uveitis is present in every case. It usually takes the form of iridocyclitis, often with nodules in the iris recognizable as tuberculous and showing a great tendency to the formation of synechiae and keratitis punctata. The ocular lesions frequently relapse and tend to leave permanent changes which may, rarely, result in blindness. Half the patients develop facial palsy always followed by recovery. Mild pyrexia also occurs in half the cases and a smaller proportion show polyneuritis, xerostomia, polyuria, lacrimal gland involvement, joint pains and erythema. The mortality is about 5 per cent.

It has been thought that syphilis, leukaemia and tuberculosis might be causes, but the authors have already shown that all the evidence is in favour of tuberculosis. Microscopically the tuberculosis is of a peculiarly fibrosing and non-caseating type showing very scanty bacilli. Two of the four cases which have come to autopsy have shown the myocardium as the seat of a similar

fibroid tuberculosis. This ends the authors' summary of symptoms. The most severe case follows on. She was 31 years of age, and one would be inclined to say that if ever a person came near death's door from polyneuritis it was this one. But she did not succumb. The details must be obtained from the original article. They make one feel, taken along with those given in the three other papers in this one number of the *Lancet*, that the disease is really more common that is actually the case. Actually it is a fairly rare condition

ERNEST THOMSON.

(4) **Böck, J. and Risak, E. (Vienna).—Recurrent oculomotor palsy and tuberculosis. (Periodische Oculomotoriuslahmung und Tuberkulose).** *Zeitschr. f. Augenheilk.*, Vol. LXXXIII, p. 7, 1934.

(4) **Böck and Risak** argue that tuberculous toxins can induce ocular palsies through vasomotor disturbances and also through more direct effects. They report the case of a woman, aged 30 years, with a tuberculous history and evidence of previous pulmonary and glandular tubercle. There was also a necrotic tuberculide on the leg; the von Pirquet reaction was strongly positive. There was a right IIIrd nerve palsy, paresis of VIIth on the right side and absence of the corneal reflex in both eyes. Under treatment with old tuberculin complete recovery set in. Following a recurrence of the lesion on the leg and its healing, the eye condition came on once again together with the facial palsy.

ARNOLD SORSBY.

(5) **Andrade, L. de (Münster).—Investigations on the influence of injury on the local reaction in the eye in tuberculous bacteraemia and its bearing on sympathetic ophthalmitis. (Versuche ueber den Einfluss von Verletzungen des Auges auf das örtliche Auftreten von Herderscheinungen bei im Blute Kreisenden Tuberkelbacillen nebst Bemerkungen zur Frage der sympathatischen Ophthalmie).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCII, p. 350, 1934.

(5) **Andrade** induced injuries in the ciliary region of rabbits and simultaneously injected tubercle bacilli into the blood stream. He found that injury is not a strong predisposing factor for the development of a tuberculous lesion; in 14 cases the injured eye was affected, in nine the uninjured one. The lesion in the injured eye was, however, much more severe, and the fact that in such eyes the anterior segment was the seat of the tuberculous lesion proves the significance of trauma in the development of the affection. Affection of the injured eye is not a determining factor

for the development of the lesion in the uninjured one, as the uninjured eye may be the only one affected. The effect of injury on the histological reaction was not such as to change the basic tuberculous nature of the lesion. On the strength of these findings the author can see no evidence for regarding sympathetic ophthalmitis as a tuberculous reaction.

ARNOLD SORSBY.

(6) **Cridland, A. Bernard. — Perforating injuries of the eye.** *Lancet*, July 28, 1934.

(6) The two page article by the late **Bernard Cridland** was received by the Editor of the *Lancet* only two days before the author's death. It does not appear to contain much in the way of new facts, but is an article which will enable the general practitioner to weigh up the consequences for an eye according to the site of the retained foreign body. The case where the eye is injured without retention of the foreign body is also discussed.

ERNEST THOMSON.

(7) **Duke-Elder, Sir Stewart (London).—The prognosis of iritis and iridocyclitis.** *Lancet*, November 3, 1934.

(7) This article, which, by the way, is one of those contributed by invitation, is so packed with information that one sits down and wonders how it is to be abstracted. Indeed, it seems to cover the whole ground in the space of two or three columns of the *Lancet*. All that can be done is to quote what the reviewer considers to be the most striking passage of it. After mentioning what is probably nearly all that is known about syphilitic, gonorrhoeal and tuberculous types of anterior uveitis, **Duke-Elder** discusses the most difficult type of all, that which is due to an infective focus "somewhere" in the body. This is some of what he says: "More than one focus may exist simultaneously; a streptococcal infection may involve the teeth, the tonsils and the colon, or two different types of infection may be firmly established in two different regions. In this way it is easy to fall into the error of over enthusiasm, and there is no doubt that in recent years, partly through insufficient understanding of the causes of diseases, partly through a desire to adopt some pragmatic and radical course of treatment, much unnecessary and mutilating surgery has been done in the wholesale removal of teeth, tonsils appendices and the rest, or in the scavenging of nasal sinuses, endometria, or colons. Time and again we see patients on whom an enormous amount of radical surgery has been performed for the sake of an iritis which goes placidly on in complete disregard for the mutilation for which it is responsible."

ERNEST THOMSON.

BOOK NOTICES

The Patient and the Weather. By W. F. PETERSEN, assisted by M. E. MILLIKEN. Vol. II, pp. 530. Figs. 249. Ann Arbor, Michigan: Edwards Brothers. 1934. Price $6.50.

In this volume the author has endeavoured to show that "the normal individual is constantly reacting to meteorological environment in a chemical and endocrine rhythm that is conditioned by the states of the gaseous envelope in which he lives." He has collected a mass of clinical data dealing with many branches of medicine, in particular focal infection, migraine, epilepsy, eclampsia, gastro-intestinal disorders, neuroses, urticaria, asthma, arthritis, glaucoma, iridocyclitis, retinal detachment, some aural and dental diseases, and alopecia areata.

He has endeavoured to demonstrate that morbid symptomatology is intimately connected with passing meteorological events.

In the section dealing with ophthalmic disorders the author has pointed out the coincidence of attacks of glaucoma, iritis and iridocyclitis with the crest of a polar infall. Cases are quoted in which the attack came on at a sudden barometric upturn and fall in temperature, or the maximum development of a cold wave.

One case of cyclitis is described as occurring during a severe storm with a falling barometric pressure and polar infall; another of iritis during a rise in temperature and humidity reaching a tropical maximum.

He points out that glaucoma is more prevalent in the northern hemisphere, and affects southern races, such as the negroes, when they come to live in the northern climate. Rohrschneider is quoted as including herpes corneae in the ocular conditions affected by meteorological disturbances. He states that scrofulous disease of the eye reaches a peak in March.

In discussing these cases the author alludes to the possibility of meteorological conditions affecting the vascular supply of the eye and so inducing a vascular crisis and thereby initiating a rise of intra-ocular pressure.

In attempting to explain the recurrence of iritis and cyclitis he alleges that the resistance of tissues of the uveal tract to focal sepsis and blood-borne infections may become altered by temporary changes in the nature of its blood supply. Periods of vascular spasm in the uveal tract may leave this tissue in an unusually receptive state for bacterial localization.

The author quotes one case of retinal detachment in an astronomer coming on at the end of a high barometric pressure and immediately in the wake of a steep drop in temperature.

He makes the conjecture that disturbed vascular supply to the developing eyes may ultimately lead to lessened functional ability and be responsible for the incidence of myopia and defective vision.

NOTES

Death

WE regret to record the death of Dr. W. J. Adie on March 17, at the comparatively early age of 48 years.

An Australian by birth and educated at Geelong, he came to Edinburgh for his medical studies and had a brilliant career as a student. After post-graduate study abroad he returned to this country and was House Physician at the National Hospital, Queen Square, to which hospital he became in due course Physician to out-patients. He was also Physician to Charing Cross Hospital and the Royal London Ophthalmic Hospital.

His name is especially associated with narcolepsy, pyknolepsy and dystrophia myotonica. He contributed papers to the *Transactions of the Ophthalmological Society of the United Kingdom*, of which society he became a member in 1930, and an authoritative article to our columns in 1932 on Tonic Pupils.

During the Great War he served overseas, at first as Regimental M.O., and later as Physician to the 2nd Army and with charge of a hospital for wounds of the head.

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Appointment

MR. J. H. DOGGART has been appointed Assistant Surgeon to the Central London Ophthalmic Hospital.

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The Cruise Clinical Research Scholarship

A SCHOLARSHIP in clinical research in ophthalmology was endowed last year at the Royal Westminster Ophthalmic Hospital. This endowment is due to the initiative of Sir Richard Cruise. For some years past he has collected sums of money from friends and patients for this purpose. He is heartily to be congratulated on the result, for the scholarship is certain to redound to the credit of British ophthalmology.

The first award was made in July, 1934, to Mr. J. E. H. Cogan, M.B., Ch.B.Glas. The value of the scholarship is £100 and it is tenable, except in special circumstances, for one year. It is hoped that in the future as further funds become available the annual value will be increased to £200.

The scholarship is open to any British subject holding a full medical qualification and registered in the United Kingdom. Holders of staff appointments at any recognised teaching hospital are ineligible. The candidate has to submit a thesis of the research he proposes to do and, if this is approved, he will be expected to work at least three days a week in the Hospital. If facilities for his research are not available at the Hospital, the Committee of Award

may, at their discretion, second him for work elsewhere. The holder is to submit three monthly reports on the work done. The thesis shall detail not only the subject chosen for research but also a précis of the present state of our knowledge and the nature of the proposed investigations.

The results may be offered for publication to the *Brit. Jl. of Ophthal.*, or to any other ophthalmic periodical. The award of the scholarship is made by the Committee of Award. This is composed of the donor (during his lifetime), the Senior Surgeon of the Hospital, the Dean of the Medical School and one other member of the Hon. Staff, chosen by the Senior Surgeon.

Applications for the scholarship for 1935 should be made to the Dean of the Medical School, Royal Westminster Ophthalmic Hospital, Broad Street, W.C.2, before June 15. Further details may be obtained from the Hospital or the Dean.

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Royal London Ophthalmic Hospital

THE Annual Dinner of the Past and Present Students of the Royal London Ophthalmic Hospital (Moorfields) took place at the Langham Hotel on Thursday, February 7, 1935. Mr. Malcolm L. Hepburn, Consulting Surgeon to the Hospital, was in the Chair.

Among those present were, Mr. T. W. Luling (Chairman of the Hospital), Sir Harold Morris, Messrs. E. P. Carter, Dryden Donkin, Sir G. Elliot-Smith, Sir William and Lady Lister, Surgeon Vice-Admiral Hall, Lt.-General Hartigan, Air Vice-Marshal Macintyre. Sir Stewart Duke-Elder, Mr. Eric Gill, Sir Arnold Lawson, Dr. Russell Brain, Mr. E. W. Brewerton, Mr. Cole Marshall, Mr. and Mrs. Davenport, Mr. P. G. Doyne, Mr. Charles Goulden (Dean), Mr. Affleck Greeves, Mr. Percival Hay, Mr. M. L. Hine, Mr, F. A. Juler, Mr. A. F. MacCallan, Mr. McMullen, Miss Ida Mann, Mr. Foster Moore, Mr. O. Gayer Morgan, Mr. Ransom Pickard, Mr. H. B. Stallard, Mr. Tarrant (Secretary), and Mr. M. Whiting.

The Toast of the Hospital and Medical School was proposed by the Chairman. Mr. T. W. Luling and Mr. Charles Goulden replied.

In the course of his speech the Dean presented his report of the work of the School during the past twelve months. During that time 355 lectures were given. At the D.O.M.S. Examinations, 11 students were successful in Part I, and 20 in Part II. One student obtained the D.O. of the University of Oxford, and one the F.R.C.S. of Edinburgh.

Mr. R. Affleck Greeves and Miss Ida Mann have been asked to give a Montgomery Lecture at the Royal College of Surgeons in Ireland. Miss Mann has also received the Mackenzie Medal. Mr. Frank Law has been elected Ophthalmic Surgeon to Guy's Hospital. Mr. Rycroft was Hunterian Professor at the Royal College of

Surgeons of England. Mr. E. F. King has been elected Surgeon to the Central London Ophthalmic Hospital. The Gifford Edmonds Prize has been awarded to Dr. T. a'B. Travers of Melbourne, the essay sent in by Miss M. A. Pugh receiving honorable mention.

Dr. J. Purdon Martin has been elected Assistant Physician to the Hospital owing to the untimely death of Dr. Adie.

The rebuilding of the School and Out-Patients' Department is now completed, having been begun in 1933. There were now much better facilities for Out-Patients' work as well as teaching.

The new extensions of the Royal London Ophthalmic Hospital (Moorfields Eye Hospital), City Road, E.C.1, embodying a new Out-Patients' Department, Pathological and Bacteriological Laboratories, Physico-therapeutic Department, Orthoptic Department, and Medical School including Museum and Library, and additional accommodation for Private Patients, etc., will be officially opened by Their Royal Highnesses the Duke and Duchess of York on Thursday, the 16th May, at 3 p.m.

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Exchange of Lecturers, 1935

AN exchange of Lecturers having been arranged between the Universities of Basle and Glasgow, Dr. A. J. Ballantyne will, in the second half of June, deliver in Basle a course of lectures on "The histological interpretation of conditions in the fundus oculi." Towards the end of the year, on dates to be arranged, Professor A. Brückner, of Basle, will deliver a course of lectures in Glasgow.

FUTURE ARRANGEMENTS

1935

May 31. – Midland Ophthalmological Society, at Bath Eye Infirmary (joint meeting with South-Western Ophthalmological Society).

June 14.—Section of Ophthalmology, Royal Society of Medicine (Annual Meeting).

July 4, 5 and 6.—Oxford Ophthalmological Congress, at Oxford.

July 29—*August* 2.—Second International Neurological Congress, in London.

October 1.—Midland Ophthalmological Society, at Birmingham Eye Hospital.

December 3.—Midland Ophthalmological Society, at Birmingham Eye Hospital.

CONTEMPORARY OPHTHALMIC LITERATURE

American Journal of Ophthalmology. *March, 1935.*

BENEDICT and MONTGOMERY. Pseudoxanthoma elasticum and angioid streaks.
RODIN and BARKAN. Hereditary congenital ptosis.
DOBSON. The management of a case of convergent strabismus.
HOLLOWAY. The ocular manifestations observed in intracranial adamantinoma.
ALVIS. Blepharochalasis.
WALKER. Concerning the technique of multiple micropuncture for the treatment of separated retina.

Annales d'Oculistique. *March, 1935.*

DAVID and HARTMANN. Ocular symptoms in meningiomata of the lesser wing of the sphenoid.
ONFRAY and PETIT. Chromatism and security.
BENOIT. A case of pseudo-membranous non-diphtheritic conjunctivitis accompanying eruptive bucco-pharyngeal lesions.

Archives d'Ophtalmologie. *February, 1935.*

CUÉNOD. Preliminary note on the presence of infra-microbian elements in trachoma follicles.
TERRIEN, VEIL and DOLLFUS. The evolution of treatment for retinal detachment.
VEIL and DOLFUSS. Obliteration of retinal tears by diathermy-coagulation.
CHARAMIS and SFALAGAKO. Epithelial cyst of the iris.
NORDMANN. Physico-chemical studies on the normal and pathological crystalline lens.

Revue Internationale du Trachome. *April, 1935.*

MACCALLAN. Trachoma. Recent progress and principles of prophylaxis.
TEWFIC. Legal and social matters against trachoma: report.
JITTA. How the Society of Nations could apply its efforts to fight against trachoma.
TALBOT. Prophylactic equipment against blindness in trachoma and gonococcal conjunctivitis.
SÉDAN. Three cases of trachoma (seasonal).
PADOVANI. Favourable action of taurocholate of soda in trachoma.
AVIZONIS. Pterygium and trachoma.

Revue d'Optique. *December, 1934.*

MAJORANA. On a new dispositive interferential and some of its applications.
ROCARD. Visibility of fire. Generalization of the notion of dazzling.

Revue d'Oto-Neuro-Ophtalmologie. *December, 1934.*

TOURNAY. The oto-neuro-ophthalmic liaison and the vegetative nervous system.
ALAJOUANINE and THUREL. What we know of the practice of alcoholization of the Gasserian ganglion.
RABINOVITCH and VENGRJENOVSKY. A case of progressive myasthenia with participation of the unstriped muscles of the eye.

Klinische Monatsblätter für Augenheilkunde. *March, 1935.*

BÜCKLERS. Clinical and histological research on capsular cataract.
MACHEMER. Contribution to the physiology and pathology of the pupil.
VON SZILY. Trachoma follicle in the choroid and in the vitreous cavity after transmission of trachoma material into the interior of the eyeball.
KOKOTT. Research on the aetiology of juvenile recurrent vitreous haemorrhages.
GILBERT. About periphlebitis and endovasculitis of the retinal vessels together with observations on scleritis, tuberculous and septic choroidal disease.

DEUTSCHMANN. The treatment of retinal detachment with tincture of iodine and carbonic acid snow.
KOYANAGI. Does the raised tension in the beginning of diabetic retinitis play an essential rôle?
SCHNYDER. The opinion of a physics department on the physics of infra-red rays.
PINCUS. Primary fat-necrosis (lipogranulomatosis) of the orbit.

Annali di Ottalmologia e Clinica Oculistica. *February, 1935.*

MARCHESINI and PAPAGNO. Clinical and anatomico-pathological contribution to the ocular manifestations in experimental beriberi.
DE VECCHI. Experimental research on the question of the aetiology of human cataract.
RUSSO. Contribution on congenital cataract, hereditary and familial and on cataracta centralis pulverulenta.
VENCO. Studies on unilateral myopia.

Lettura Oftalmologica. *November, 1934.*

VELLA. Primary melanosarcoma of the bulbar conjunctiva and the genesis of melanosis.
SANGUINETTI. Glaucoma and cataract.
FEDE. Vaccine therapy for trachoma.

December, 1934.

PADOVANI. Zoster ophthalmicus and varicella.

January, 1935.

GIANNANTONI. Lesions of the retina and of the optic nerve from electricity.
CAMOZZI. On the estimation of loss from ocular disasters.

February, 1935.

MARGARITELLA. Clinico-experimental contribution to the use of strychnine in some ocular affections.
MONTANELLI. Further remarks on sulphur therapy in ocular diseases.

Bollettino d'Oculistica. *February, 1935.*

VILLANI. Action of diathermy on ocular tension.
ANELLI. The elastic palpebral fibre in the animal series.
BOSSALINO. The leucocyte count in primary trachoma, during and after auto-haemo-therapy.
BASILE. Effects of Roentgen therapy in thrombosis of the central retinal vein.
PEREYRA. Medical and surgical diathermy in ophthalmology.
SALA. Xanthomatosis lentis.
VITO. A case of lymphoangioendothelioma of the lid.
BIFFIS. Position of the iris diaphragm in the eye.

Archivos de Oftalmologia Hispano Americanos. *February, 1935.*

ORTIZ. The value of radiographical examination in the pathology of the lacrymal passages.
CASANOVAS. Melanoma of the caruncle.
CASTAN. Marginal degeneratien of the cornea.
SEVILLANO. An interesting case of dacryosolenitis.

Revista Oto-Neuro-Oftalmologica. *February, 1935.*

PAVIA. Sella tumour operation. Relapse. Subsequent alterations of the visual field under the action of deep X-ray therapy.